IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication OCTOBER 5, 1961

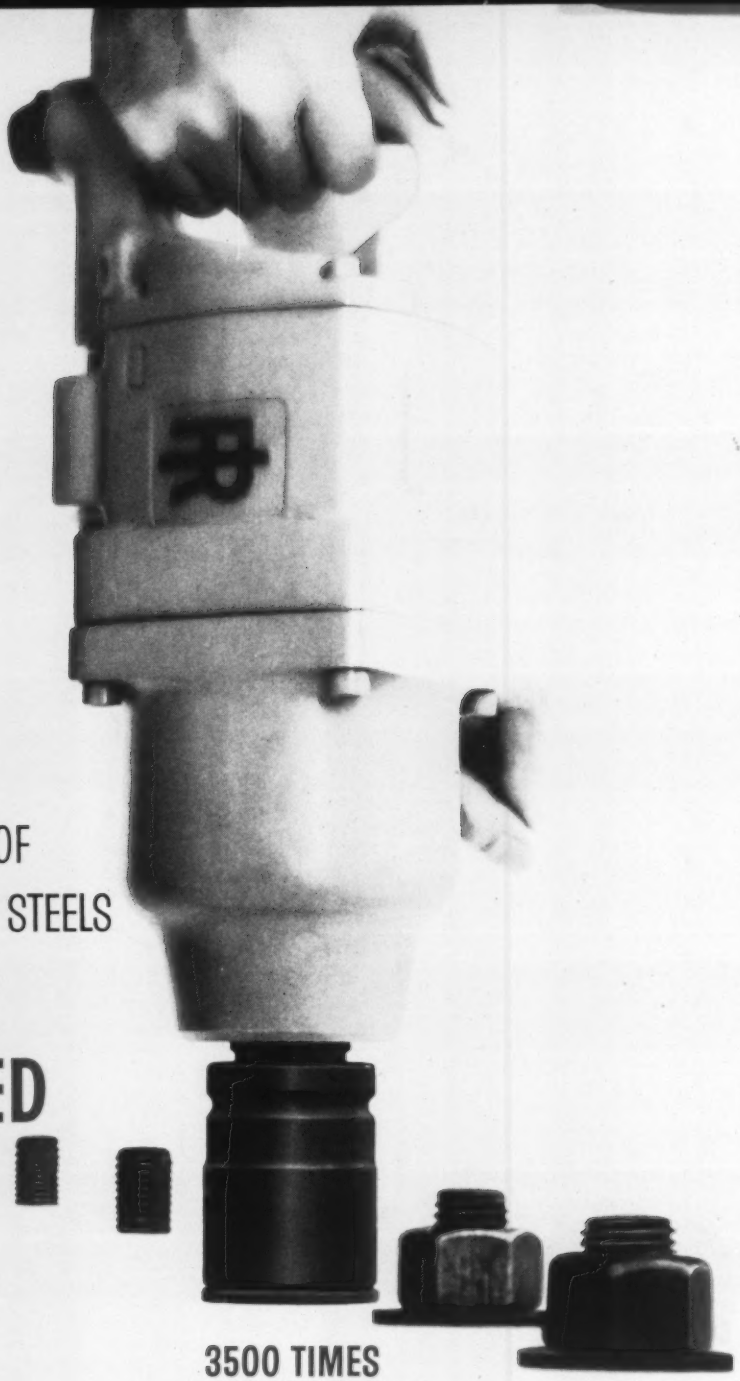
★ West Berlin Industrialists Report—

How W. Berlin Stands Up In East-West Crisis p. 41

How Congress Treated Business p. 44

Oxygen Enriches Fuel Injection p. 69

Digest of the Week p. 2-3



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LEAD TREATED STEELS

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Switching to leaded* Aristoloy, Ingersoll-Rand was able to provide the high impact resistance (3500 per minute) and transverse strength required in these hammer case bushings. Use of leaded steel also cut machining time . . . eliminated tearing by the forming tool . . . extended tool life 10% . . . and shortened grinding time. Find out about these free machining lead treated steels—write for LEADED STEELS CATALOG today.

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Tool Steel Topics

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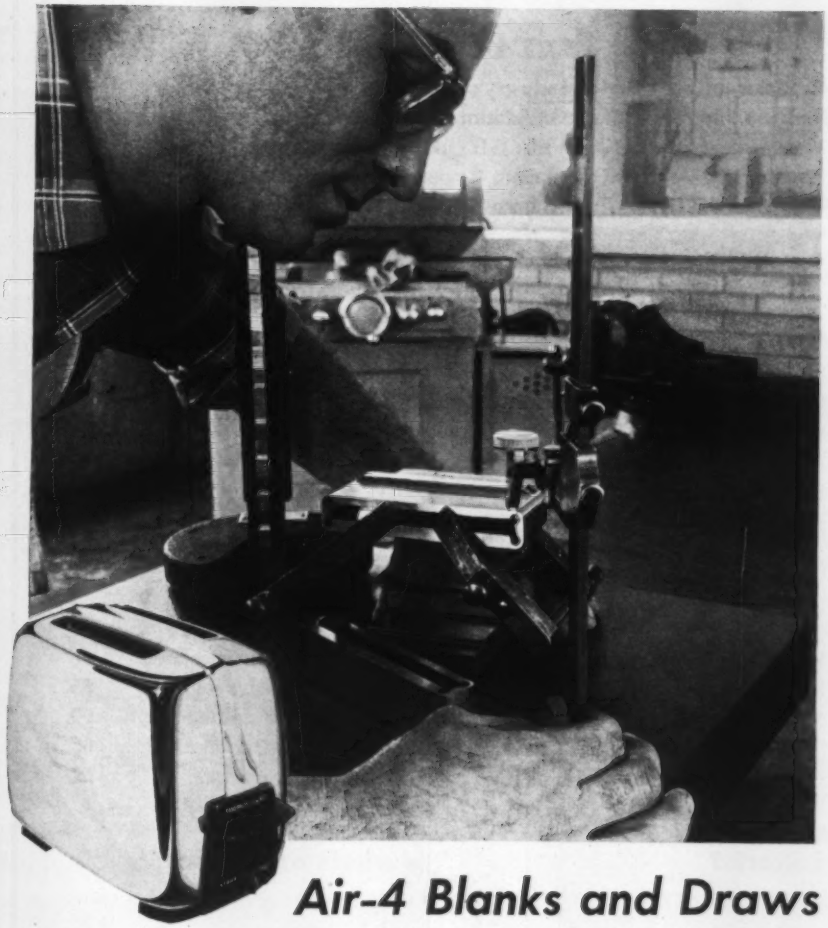


Air-4 Blanks and Draws Bread Slots in GE Toaster Shell

This blanking and drawing die, made from Bethlehem Air-4 tool steel, forms bread slots in .030-in. steel sheet for a General Electric automatic toaster. Hardened to Rockwell C 59, the die sections were made by Yarema Bros. Tool & Die Co., Allentown, Pa. They were pleased with Air-4 for two reasons—minimum distortion during heat-treatment, and easy machinability.

Hardens in Air at 1550 F

One of the big advantages of Air-4, Bethlehem's new free-machining medium-alloy tool steel, is its ability to harden in air at low temperature — about 1550 F. Air-4 has exceptional free-machining characteristics because just the right amount of lead has been added. It has high wear-resistance, excellent toughness, and deep-hardening properties — everything you need for economical tool service.

Our booklet on air-hardening steels includes full data on Air-4. For your copy, write to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. Ask for Booklet 548.

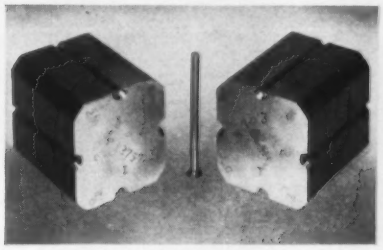
BETHLEHEM TOOL STEEL ENGINEER SAYS:

Lehigh H Is the Work-Horse Of the Cold-Extrusion Industry

Bethlehem's Lehigh H, a high-carbon, high-chromium (AISI type D-2) tool steel, is the most widely used tool steel in the cold-extrusion industry. And for good reasons. Lehigh H has an unusually good combination of properties: high compressive strength, deep hardenability, and high resistance to wear.

Lehigh H is used for a wide variety of cold-extrusion tools, such as punches and mandrels which are subject to compressive loads or abrasion. Whenever it is used for containers, bushings, or similar parts which are subjected mainly to tensile loads, it is supported by an external shrink ring.

Cold-extrusion tools of Lehigh H are usually made to a hardness of Rockwell C 58-60. Occasionally they are tempered back to C 55 to avoid breakage. Using a hardness above C 60 is not recommended, because such a hardness is obtained only at a sacrifice of proper tempering.



COLD-HEADING DIE STEEL SPEEDS HEADING OF SCREW BLANKS

These gripper dies are used by Southern Screw Company in forming blanks from steel wire. The dies, made of Bethlehem Cold-Heading Quality tool steel, produce about 150,000 blanks before redressing is required. Bethlehem Cold-Heading steel resists shock because it is carefully controlled for hardenability. It also has a carbon range selected to give good wear-resistance and high toughness.

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IRON AGE

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Special This Week

West Berlin: Business Amid Crisis

In the midst of the cold war struggle, W. Berlin industrialists like Rudolph Lubcke, right, a top official of the city's biggest metalworking plant, are trying to do business as usual. In this Special Report filed from W. Berlin, Editor G. F. Sullivan reports attitudes and reactions in this outpost of the Free World. p. 41

How Business Fared in Congress

The New Frontier faded into the distance as the past session of Congress progressed. Liberal legislation was often sidetracked in spite of Congressional leaders. But stronger pressures were exerted by an anti-business Administration. p. 44

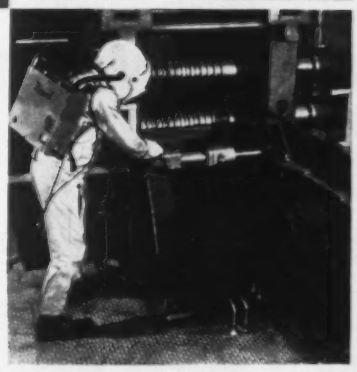
Oxygen Enriches Blast Furnace Fuels

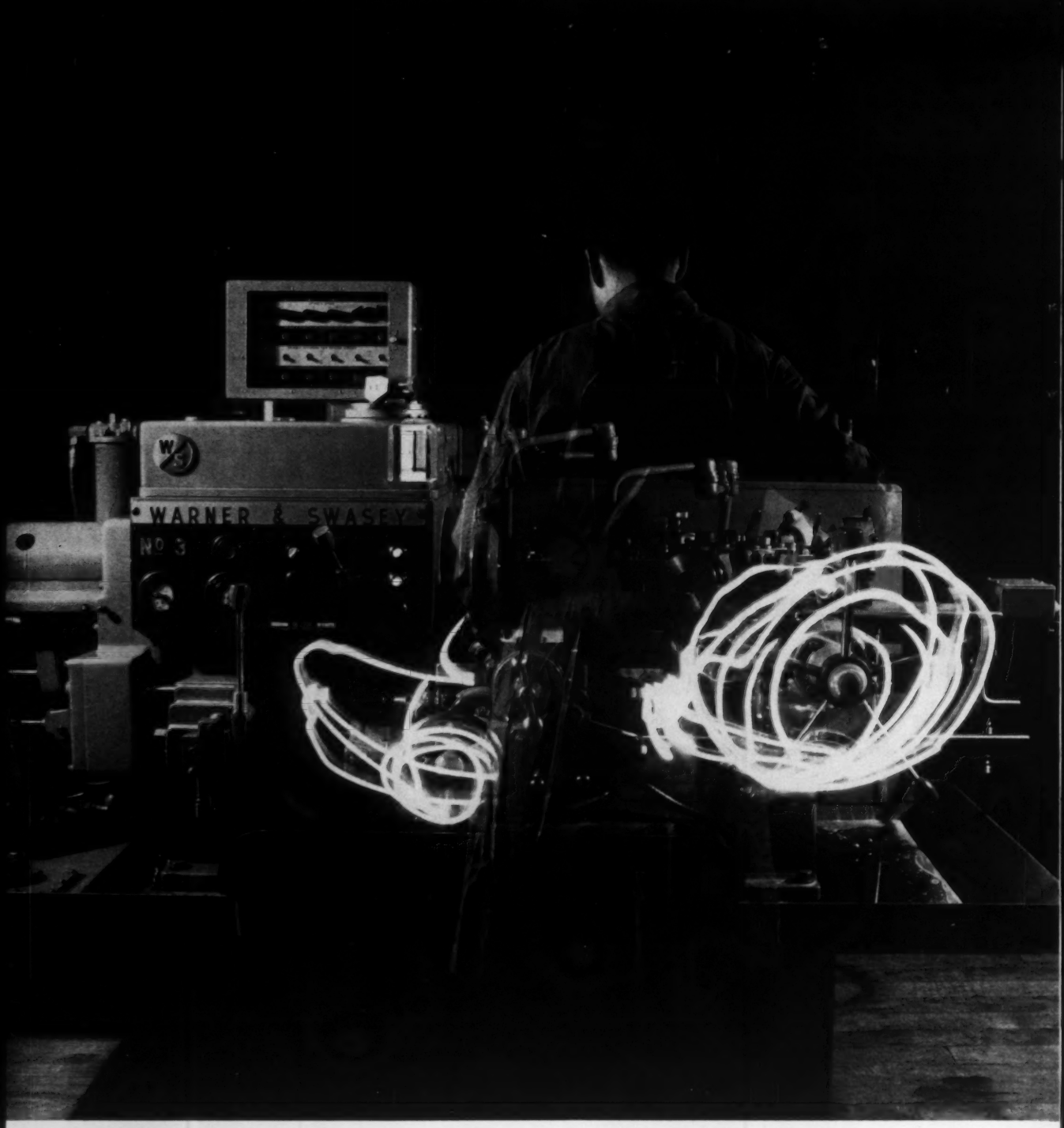
Oxygen is now being used to enrich fuel injections into the blast furnace. Results show: Iron output up 50 pct; coke rates down 20 pct; smoother furnace operation; maximum blast temperatures can be used; and there's no penalty from low-grade ores. p. 69

Next Week

How Forming Trends Are Shaping Up

Next week's special feature is the fourth in a series on Metalworking's Technological Explosion. The shape of things to come depends to no small extent on new ways to form metals. A full-color report will cover forming trends for the nation's future.





Hands off the headstock! Electro-Cycle automates spindle start, stop, reverse and speed changes throughout the entire machining cycle. With headstock handling eliminated, the operator develops a highly efficient rhythm for fast-cycle production. Turret lathes with exclusive Electro-Cycle control are built by The **Warner & Swasey** Company, Cleveland.

He's a Slippery Guy: Who? Khrushchev of Course!

Our President made it clear in his United Nations speech where all of us stand. Some way, it must be put across to Mr. Khrushchev that Mr. Kennedy means exactly what he says.

It ought to be made clear, too, that the UN blasts of Mr. Gromyko—Mr. Khrushchev's errand boy—are for the birds. His talk of peace while he curries favor of neutral nations should fool no one. Unfortunately, it does among some "uncommitted" nations.

Americans, the President says, will go to war to defend individual rights in West Germany and in West Berlin. This may or may not have a sobering effect on Khrushchev. But it is the truth. It's the "other" nations we have to convince in some way that the Reds are playing the most diabolical game since the dawn of history.

We must think in terms of action; something that will offset and refute Red claims of peaceful cooperation. It ought to be made clear that Mr. Khrushchev is at home making all the real bullets, plans, and snares for those who he believes are naive Americans.

Any nation that meets and pleads for peace and a ban on nuclear tests and then starts a nuclear testing program overnight that took months to prepare is a blight on humanity. It's time the "uncommitted" nations knew this. Diplomatic words are not needed to tell them.

Khrushchev is trying to find Mr. Kennedy's weak spot. After Laos and Cuba—and the Vienna meeting with Khrushchev—the President has no weak spots as far as the Reds are concerned. But the slippery old Russian peasant—and supreme dictator—will not stop probing.

We are in for a paralysis of the United Nations. Russia will see to that. What Gromyko has to say at the UN is nothing but words, words, words. But these histrionics take on a serious aspect in view of the new "nations" hardly out of their stone age diapers. The African nations have a balance of power in the UN which Mr. Khrushchev wants for his backdrop—when he pushes Mr. Kennedy to the brink of war over Berlin and other world spots.

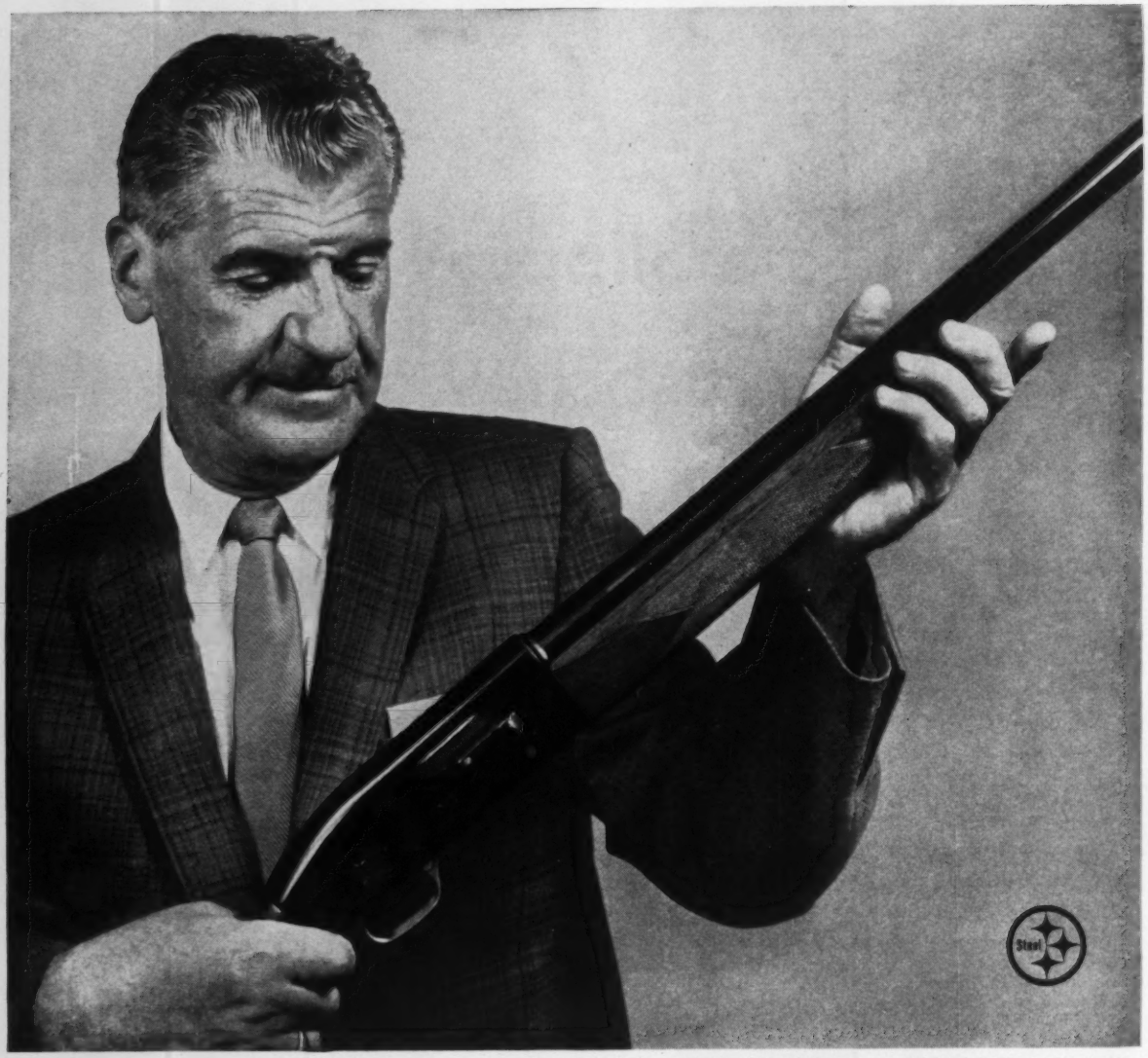
Make no mistake about it. Mr. Kennedy and the rest of us are dealing with the slipperiest guy alive. We must bone up on every way possible to contain—or at least hold at bay—this character.

If we don't learn soon, we are in for a long siege of cataclysmic troubles.

Tom Campbell

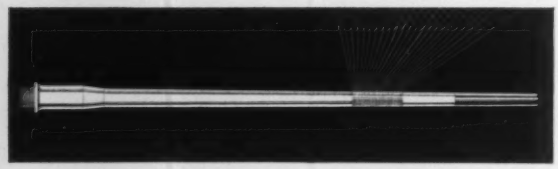
Editor-in-Chief

Tomorrow's tubing technology—today



The Superior tubing used in the barrel of the Winchester Model 59 is .772 in./.777 in. OD x .727 in./.732 in. ID. The material is Seamless Type 1035 carbon steel overwound with glass fibers.

Superior tubing helps make a lighter shotgun barrel



When starting development work on its Win-Lite steel and glass fiber wound shotgun barrel, Winchester-Western Division, Olin Mathieson Chemical Corporation, New Haven, Conn., turned to Superior for help in getting the steel tubing required. After consultation with the company's engineers, we recommended Seamless Type 1035 carbon steel tubing with special heat treatment to provide the yield strength and ductility needed to permit upsetting of the stock end of the barrel. We also helped establish a sampling program to provide the desired surfaces, particularly ID smoothness. The result was a barrel that combines the strength of steel with the strength and lightness of glass fibers skillfully wound, fused and bonded to the thin steel liner—a stronger barrel than ever before.

If you have a problem involving small-diameter tubing, call on us. We offer more than 120 analyses, in sizes from .010 to ⅝ in., and in quantities from 50 to over 1,000,000 ft. Bulletin 42 gives details. Write for a copy today. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

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The big name in small tubing

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Consumer Confidence Up—But

"Consumer confidence in the economy has improved decisively during the past three months." This is what the U. of Michigan Survey Research Center says, based on a study made in August.

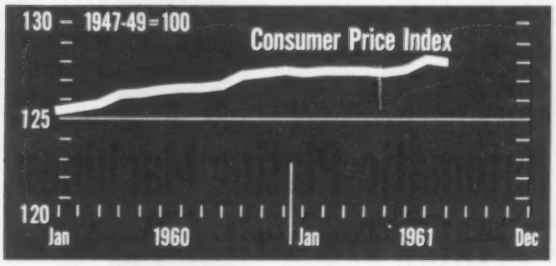
The latest survey shows the Index of Consumer Attitudes and Inclinations to Buy has "fully recovered" its pre-recession high of January-February 1960. But it remains below peak levels of 1955-56.

Intentions to buy cars are up 10 pct over last year. And intentions to buy houses are up slightly.

But a gray area is noted by the researchers. They anticipate "no real boom in spending on durable goods." Reasons: Persistent high-level unemployment and worsening international tensions.

Stable Price Pattern Holds

In August, prices paid by consumers took their first dip since April. The Consumer Price Index fell by 0.1



pct between July and August to 128.0.

There is special significance to steel and related industries in the August index. Contracts for 580,000 workers in these industries call for a review of the C-O-L escalator allowance based on the month's index.

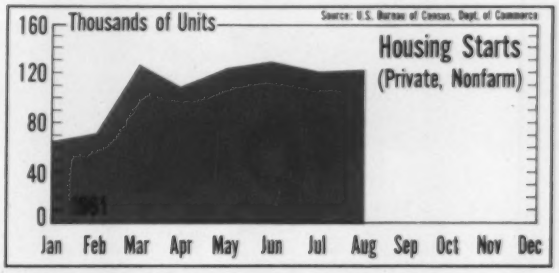
The index is high enough to mean these workers get .03¢ per hour increase on Oct. 1. But it is not yet known whether this will be paid in cash or used to offset insurance cost increases.

How this is settled could have a bearing on steel labor talks this summer. If the rank and file don't like present escalator decisions, this could be another stumbling block issue at the bargaining table.

Easy Credit Doesn't Sell Houses

Even bankers are now coming around to realizing that it takes more than easy credit to boost housing sales. A leading national bank letter shows a neat pattern of lag time from point of credit ease to when buyers take advantage of the easier terms and buy houses. In the past this was about six months.

But the bank admits the pattern went out the window in 1960 and 1961 so far. The conclusion of the



bank is one that is winning disciples daily: "Evidence suggests the post-war housing shortage is now over and it is no longer possible to induce a large-scale increase in home building simply by creating easy money conditions."

Will White House Visits Help?

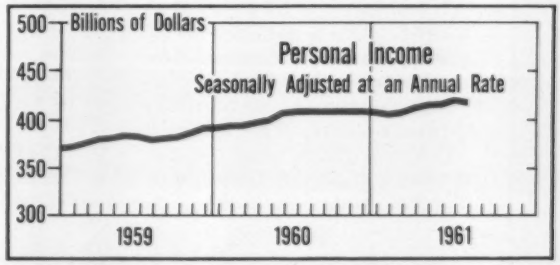
A question now on the minds of many businessmen is whether visits to "the man in the rocking chair" by industry leaders will help government-business relations. The White House visit of Roger M. Blough, U. S. Steel Corp. board chairman, may be the opening gun by President Kennedy to prove he is not anti-business.

Hopes for "personal diplomacy" are high, but it remains to be seen if results will follow. It has failed twice before—in two other administrations.

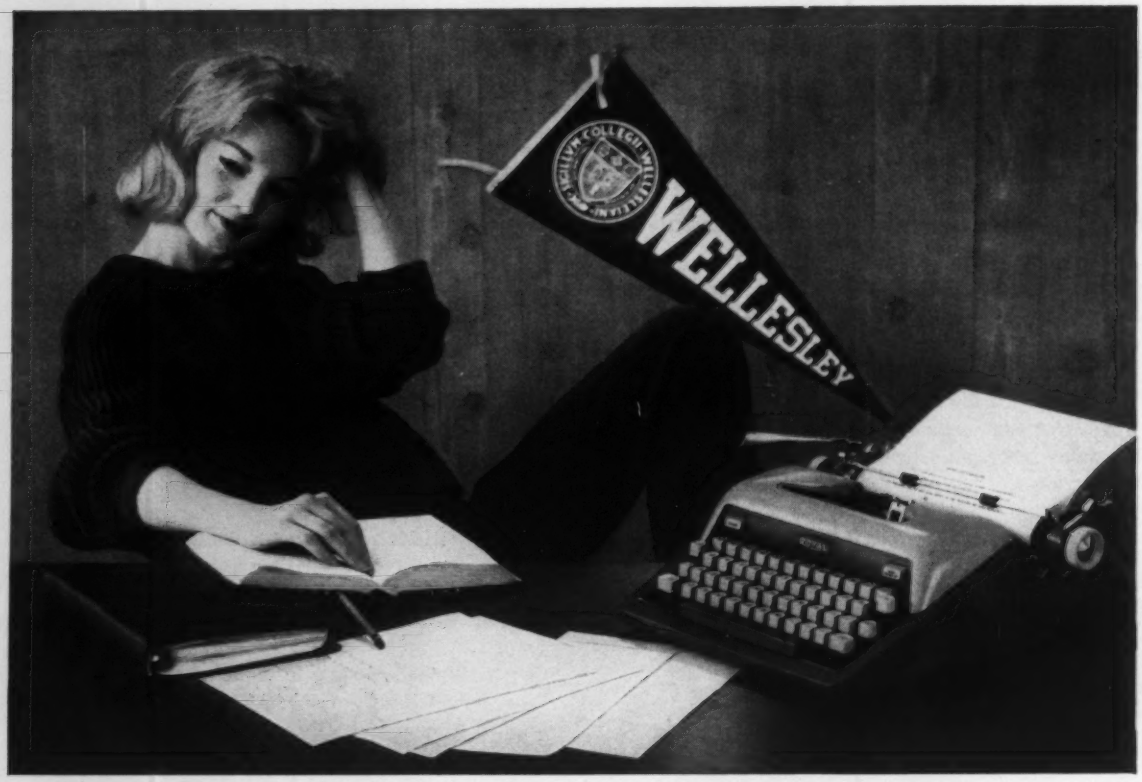
Personal Income Rise Slows

A five-month string of rises in personal income was halted in August. Income dropped $1.9 billion from July to $419.3 billion on a adjusted annual rate.

Actually, income is still on the rise. In July, a step-



ped-up dividend payment of $2.6 billion to veterans was added to that month's total. If this non-recurring payment is erased from the scene, then August shows an income gain of $700 million over July.



TAKEN FOR GRANTED

...She's concerned about the theme due next week. Never any doubt about the performance of her ROYAL PORTABLE which she "beats" on the average of 20 hours a week. Reliability's taken for granted—the greatest compliment you can pay any product.

Royal McBee Installs 2 Meaker Automatic Plating Machines to Process Over 150 Royal Portable Typewriter Parts

Much of the taken-for-granted reliability for which ROYAL PORTABLE TYPEWRITERS are famous is due to the precision plating of over 150 components done on 2 MEAKER AUTOMATIC PLATING MACHINES. One unit takes care of the entire production requirements for chrome plating — plus an equal amount of nickel plated parts. The second MEAKER plates over 100 different components in bright or "black" zinc.

Reports Mr. C. H. Farrington, Production Manager of Royal McBee's new "showplace" plant in Springfield, Mo.: "We particularly like the custom designed automatic programming on our MEAKER. We plate nickel and chrome or just nickel on one unit, and either bright or "black" zinc on the other, in any sequence desired."

Since 1899, THE MEAKER COMPANY has designed and built automatic equipment for continuous or batch-type metal finishing for large or limited production requirements. Our experience has shown that many medium size shops can pay for a MEAKER AUTOMATIC in labor savings and consistent quality production alone.

Our latest catalog "WHEN TO AUTOMATE" will give you some valuable ideas on improving your profits picture through automatic metal finishing or plating.

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Metalworking Newsfront 2

USWA: Push Shorter Week—But Not Hard

United Steel Workers of America may be reviving its demand for a shorter workweek—but not too seriously. The proposal is dead, but it's still good for trading bait—as it was in auto talks.

I. W. Abel, secretary-treasurer of the union, once again raised the question in a recent speech at Pueblo, Colo. A year ago at the Steelworkers' convention, union officials hammered hard at the theme of fewer hours in a workweek. President David J. McDonald said he would seek Federal action for a 32-hour workweek.

But, the short workweek was traded for "security" in auto talks. The economy and employment are recovering. President Kennedy is against it. And if all that isn't enough to kill it, the tense international situation and defense buildup make it impractical, unpopular and unpatriotic.

NLRB: Under Fire From Congress

National Labor Relations Board and practices under labor laws the Board oversees are under fire from Congress. A group of House Labor Committee members told the NLRB to move faster and get tougher on enforcing labor-management laws. They admonished the Board for getting bogged-down in red tape.

The legislators also said Congress should provide contempt penalties for deliberate delays by unions or companies in carrying out NLRB orders.

They recommended that the Board disbar from NLRB practice lawyers who advise their clients to commit unfair labor practices. They also urged the Board to seek Justice Dept. action in instances of community pressure being exerted against union organization drives.

PML: It's a Raid

Pattern Makers League, a small craft union in the AFL-CIO, is again trying to carve off a chunk of the auto industry from the UAW.

It has received permission from the Detroit office of the NLRB to hold an election at all Chrysler Corp. plants with pattern makers. The craftsmen would vote for either PML or the UAW.

The UAW has filed "raiding" charges. Chrysler also opposes the move. Large companies want to deal with as few unions as possible.

If the Pattern Makers are successful, it clears the way for a wave of raiding in the skilled trades groups.

In that event companies could be faced with the prospect of a series of crippling strikes.

These would be the type which take place in industries with multiple unions. Examples of such areas are the railroads and the printing industries.

Horse Trading Still Pays Off

Negotiating a new contract doesn't have to be all give and no take. Imaginative horse trading still pays off. This was brought out at the 14th annual labor relations conference of Associated Industries in Cleveland last week. Fred M. Wistert, industrial relations director for Electric Autolite Co., showed how it can work.

In one plant, seven leading workers started a "slow down" program. They were fired. The company then "traded" reinstatement for a new incentive program.

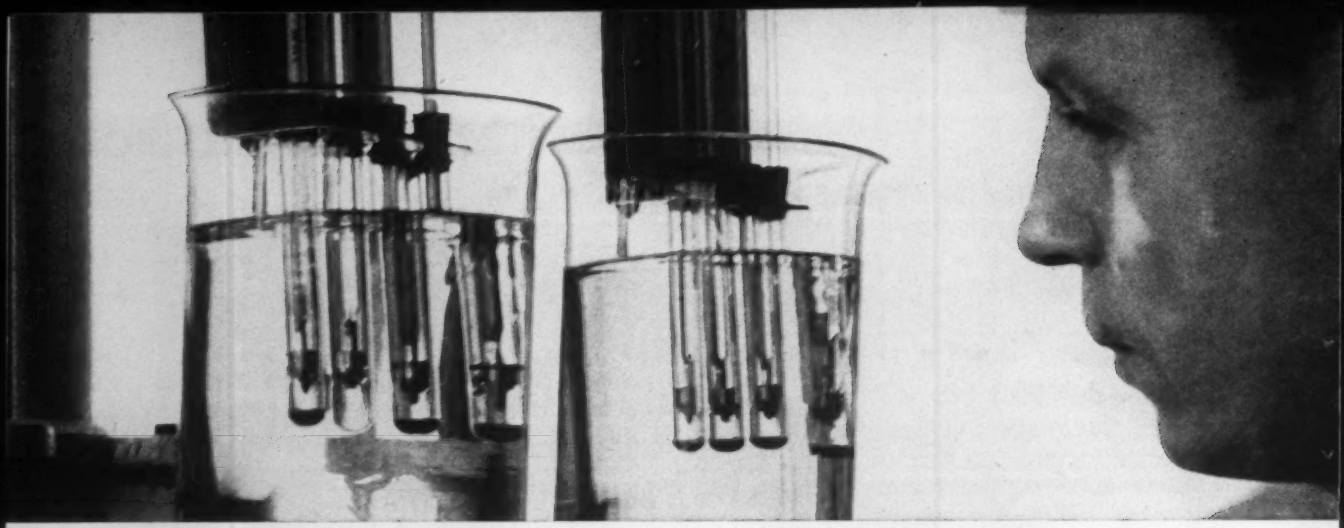
In another plant "an all-powerful union steward" was earning $15,000 per year with overtime. He was allowed to keep his job—without overtime—on condition a new incentive system would not be opposed. In other plants workers were warned the plants would have to be closed unless a new incentive system was put into effect.

Customers, too, can help, Mr. Wistert says. One long strike was brought to a swift end when the customer announced he was going to remove his dies from the struck plant. Strikers quickly saw this would mean lost work and the strike ended "honorably" the next day.

Mr. Wistert also revealed his method for getting union negotiators to make firm their economic demands. He tells them: "If I had a proposal for a settlement of 'X'-cents-per-hour, I could probably sell it to management."

Dr. Paul N. Lehoczky, chairman of the Industrial Engineering Dept. at Ohio State University, said the foreman "is still the weakest link in the management hierarchy."

Why? "Nobody in his right mind wants to be a foreman," he says. "He isn't in the confidence of management, yet he represents management to the workers. He makes commitments which soon become past practices. Then he gets it from both ends."



Dropping point test shows how greases react to heat. Beaker fluid has been heated to 390°F. All greases tested except Darina (second tube from left) have passed from solid to liquid state.

BULLETIN:

Shell reveals the remarkable new component in Darina Grease that helps it save up to 35% on grease and labor costs

Darina® Grease is made with Microgel*, the new thickening agent developed by Shell Research.

Darina lubricates effectively at temperatures 100° hotter than most conventional soap base greases can withstand.

Read how this new multi-purpose industrial grease can help solve your lubricating problems and even save you up to 35% on grease and labor costs.

THERE IS no soap in Darina Grease. No soap to melt away—wash away—or dissolve away.

Instead of soap, Darina uses Microgel—a grease component developed by Shell Research.

What Microgel does

Because of Microgel, Darina has no melting point. It won't run out of gears or bearings.

Compared with most conventional soap-base greases, Darina provides significantly greater protection under adverse service conditions.

Mix water into Darina and the grease does not soften. It shrugs off water—won't emulsify.

Resists heat

Darina will withstand operating temperatures 100° hotter than most conventional multi-purpose greases. It cuts leakage and reduces the need for special high-temperature greases.

Also, Darina resists slumping, thus forming a more effective seal against foreign matter.

Saves money

Shell Darina can reduce maintenance expenses while it protects your machinery. Savings of up to 35% on grease and labor are quite possible.

In some cases lubrication intervals have been extended to double what they were before. Less grease is consumed and less time consumed applying it.

For details, see your Shell Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, New York.

*Registered Trademark

SHELL

A BULLETIN FROM SHELL
–where 1,997 scientists are helping to provide better products for industry

★ Tax Reform Dead for Now

Overall tax reform will be proposed by President Kennedy in the next session of Congress. But legislative action won't come until 1963 —or 64—or even 65.

The delay of general tax reform, however, doesn't rule out tax changes in 1962. There will be some major revisions in business tax incentives, taxes on foreign operations and expense account deductions.

But the overall tax reform the President has promised will have to wait. This delayed reform will include changes in the rate structure, depreciation reform, revision of capital gains taxes and changes in depletion allowances.

Although the White House and the Treasury Dept. won't confirm it, tax reform legislation will not be introduced until late in the next session. With the hearings and legislative wranglings which will follow, no action could be completed until 1963. Even 1963 is doubtful.

A sweeping reform of federal taxation has little chance of passage in one year. Although hearings by the House Ways and Means Committee might be complete in 1963, enactment would be more likely in 1964.

To carry this process almost to the ridiculous, it might also be pointed out that 1964 is a national election year—not a good time for elected officials to be fooling with taxes. Conceivably, election-conscious Congressmen could put off a vote until 1965.

The Administration apparently has promised Congressmen that the general reform won't be pushed in 1962. But the President will seek passage of tax changes proposed in the last session of Congress.

Therefore, next year's session of Congress will act on the investment credit plan for business which the President seeks. The House Ways and Means Committee supports the move. Congress also will act to tighten expense account deductions and foreign "tax haven" operations.

■ Industry Ignores Its Patent Rights

Some Washington patent experts suggest that the courts, not Congress, decide patent rights questions. And they blame industry for not standing up for its patent rights.

Congress has been considering giving the government more control over patents developed under Federal research and development contracts.

The patent experts, in a report for the George Washington U. Patent Foundation, make these two major points:

American industry may be doing itself grave harm by its reluctance to defend itself in court when its practices are challenged.

Avoidance of court tests and frequent resort to negotiation or consent procedures may prejudice or compromise the future existence of patent right now clearly possessed.

■ Shipping Rates Due For Congress Action

Disagreements between railroads and truckers on transportation ratemaking will be ironed out by Congress next year. Metalworking companies should watch President Kennedy's actions in the near future to get a clue to ratemaking changes.

The Commerce Dept. is drafting a series of messages for the President to send to Congress touching on many aspects of transportation problems. Suggested cures for the industry's ills vary widely.

Shippers ask for more competition, common ownership and lower rates. Rails ask for more rate freedom, user charges, tax breaks and common ownership. Truckers want "gray area" trucking stopped, "destructive" ratemaking among regular carriers stopped and more modern size and weight standards. They oppose common ownership by rails.

■ Oxygen Growth Is Spurred By Steel

The oxygen industry is one of the real growth industries in the U. S. And its growth, from 10 to 15 pct annually, is directly related to the steel industry.

The U. S. Commerce Dept. reports the steel industry is the largest user of oxygen. The use of oxygen in the production of raw steel became especially significant in the mid-1950's.

The government says the use of oxygen per ton of raw steel produced has increased to 500 cubic feet in 1960 from less than 200 cubic feet in 1955. In the past five years, output of oxygen has nearly doubled from less than 30 billion to 56 billion cubic ft.

■ Changes Made In Renegotiation Pleas

The U. S. Renegotiation Board now allows appeals on refund cases direct to Washington.

New regulations have been approved that provide a contractor has the right to present his case directly to the parent renegotiation board in Washington if he is not satisfied with a regional board refund determination.

Reduces Acid Cleaning and Pickling Costs

ACTIVOL

Reg. U.S. Pat. Off.

USE ACTIVOL AND GET:

- Faster and more effective removal of scale, rust, oil and salt deposits in acid cleaning
- Less burning or etching of base metal, plus reduced hydrogen embrittlement
- Lower costs per ton of metal processed because acid baths last 25% to 50% longer, requiring less frequent fortification
- A better pickle at lower temperatures with less fumes and odors
- Lower inhibitor expense—ACTIVOL costs less to use

ACTIVOL is a series of entirely different, completely soluble, **odorless** neutral chemicals that can be used with any organic or inorganic acid. They control cleaning and pickling action while inhibiting against base metal attack to produce cleaner, brighter steel ideally suited for subsequent finishing.

USE* ACTIVOL *FOR:

- **All Metal Pickling Operations**
- **Preparing metal for galvanizing, tinning, plating and painting**
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Find out how ACTIVOL can save money and improve metal cleaning operations in your plant. ***Write, wire or phone.***

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Balance in the Black —For a While

The U. S. balance of international payments showed up on the favorable side in the second quarter. But the plus value was due to extraordinary repayments of postwar loans, not to any upsurge in exports.

The balance of payments showed an excess of $90 million of receipts over payments. Except for the extra-large loan repayments, payments would have exceeded receipts by about $635 million, according to the Dept. of Commerce.

The major factor in the increase of net payments was a decline in the trade balance, mainly because of lower exports. Imports started to rise in line with the business upturn in the U. S., although the rise was small.

U. S. Companies Expand Overseas

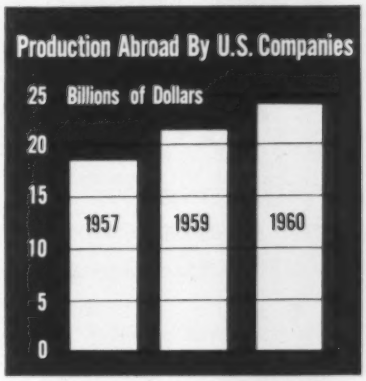
Production and sales of goods produced abroad by U. S. companies is growing at a rate of more than 12 pct a year. Foreign production now far outstrips exports of manufacturers from the U. S.

A Dept. of Commerce study shows that sales of goods manufactured abroad by foreign subsidiaries and branches of U. S. companies reached $23.6 billion last year. This is a gain of 12 pct from 1959 and is more than $5 billion over 1957 sales.

The new study pinpoints that output of U. S. companies in Europe accounted for 60 pct of the sales increase of foreign plants since 1957. Production increases in Latin America are chiefly due to accelerated production in U. S.-owned auto and truck plants.

Sales in Canada account for the biggest national share ($8.9 billion in 1960), but rate of growth is slower, matching that country's slower rate of industrial expansion.

Sales from U. S.-owned foreign plants result in a higher total than U. S. exports. Between 1957 and 1960, exports of manufacturers from the U. S. advanced from $10.8 billion to $11.3 billion. In the same period, production in U. S.-owned plants rose from $18.3 billion to $23.6 billion.



British Ponder ECM Problems

Rumors that the British pound will be devalued slightly are again rife in international banking circles. The theory is that such a move would make it easier for Britain to "harmonise" its economy with that of the European Common Market.

The British government, backed by industry, is all for joining the ECM. Commonwealth nations and farm groups are still opposed. Political and agricultural integration are both basic in the ECM treaty—but, to date, there has been little of either in the ECM itself.

So, while odds favor British entry, you can bet that if Britain does sign, the agreement will be liberally laced with doubletalk in the political and agricultural areas.

If Britain joins without nailing down policy in these critical areas, it will be said to have joined the ECM, bringing other Free Trade Assn. nations along. But the end product will be a customs union, which is a far cry from what the ECM is alleged to be.

Eximbank Authorizes Japanese Expansion

The Export-Import Bank has authorized a $6.5 million credit to the Japan Steel and Tube Corp. (Nippon Kokan Kabushiki Kaisha) of Tokyo.

Wean Engineering Co., Warren, O., will supply U. S. equipment for expansion of the plant located in the Tokyo-Yokohama area.

The Eximbank loan covers costs of a continuous strip annealing line and an electrolytic tinning line. Nippon Kokan is the third largest steel producer in Japan. The loan is scheduled for repayment over a period of 10 years, beginning in 1963.

Exports to Reds Under Scrutiny

Next month's Congressional investigation of U. S. exports to communist countries will deal with several metalworking items.

The hearings, to probe government export licensing policy for communist nations, will take up the exports of:

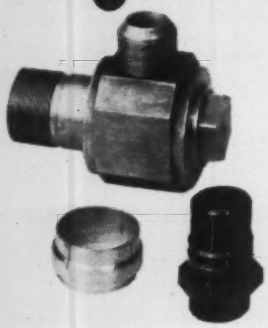
Grinding machines which make miniature ball bearings usable in missiles.

Scrap iron to Yugoslavia in heavy shipments.

Machine tools which make truck and plane engines, licenses for which have been granted, revoked, and are pending again.

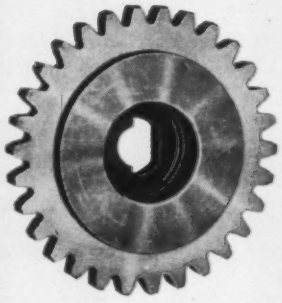
REPORTS ON RYCUT

world's fastest machining alloy steels in their carbon ranges



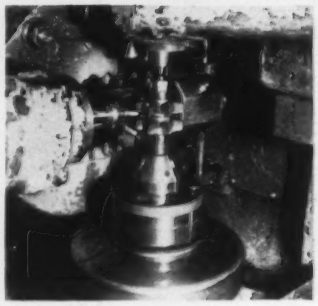
CUTS PRODUCTION COST 50% for Flodar Corp.

This manufacturer of high pressure hydraulic tube and pipe fittings reports production cost savings of 50% after switching from 4150 to Rycut® 50 and from 4140 to Rycut 40. In addition to higher production, Rycut machined to a better finish, held size perfectly and eliminated scrap loss. (With 4140 and 4150 scrap loss ran up to 30%.) And tool life, from 1 to 3 hours with the standard alloys, was boosted to 8 hours with Rycut.



MACHINES 35% FASTER for American Bosch

Rycut 40 was selected by American Bosch for this plunger drive gear for a diesel injection pump because it machines 35% faster than 4140—keeping machining costs at a minimum without sacrifice of mechanical properties. The company also found that Rycut 40 produced a better finish than 4140 and reduced down time by lengthening tool life.



BOOSTS SPROCKET PRODUCTION for McCulloch Corp.

These are the results obtained at McCulloch Corporation when they switched from non-leaded alloy to Rycut 40 for chain saw sprockets. Turning, forming, reaming and drilling operations: hourly production rate raised from 68 to 100 pieces—tool life lengthened from 3½ to 5 hours. Hobbing machine operations: hourly production raised from 43 to 65 pieces—tool life lengthened from 3916 parts per tool to 5874.

Rycut is available in a wide range of analyses: Rycut 20 is a case carburizing, oil hardening steel, with balanced composition. Rycut 40 annealed attains greatly varied strength and toughness, depending on heat treatment, making it suitable for an unusually wide range of applications. Rycut 50 annealed may be preferred (to Rycut 40) for parts with large mass or applications requiring higher mechanical properties. Rycut Heat Treated, stress relieved, assures uniform properties and machinability—carbon content is matched to bar size. Call Ryerson for any alloy requirement—and get top technical help, too.

RYERSON METALOGICS

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE INLAND® STEEL FAMILY

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Titanium Submarines?

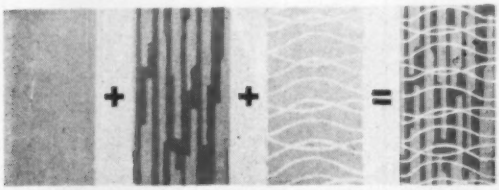
There's a good chance that submarine hulls of the future might be constructed of titanium alloys. Battelle researchers have produced crack-free welds in high-strength, 2-in. thick, titanium-alloy plate. Automatic Mig welding inside an argon-filled chamber was used to make the welds. Previously, 5/8-in. plate was the limit.

Clue to Coke Consumption

Now, by use of a new formula, blast furance operators can predict the rate of coke consumption under conditions of changed raw materials, operating practices or hot-metal specs. This is the word from R. V. Flint, U. S. Steel Corp. expert, who also points out that accurate development of such knowledge is important because "blast furnace coke is the largest single item of conversion cost in an integrated steel plant."

Building with Color

Multicolor porcelain-enamel panels offer a new design medium for builders. With a special silk-screening system, distinctive effects are achieved



DECORATIVE PANELS: Add color to buildings.

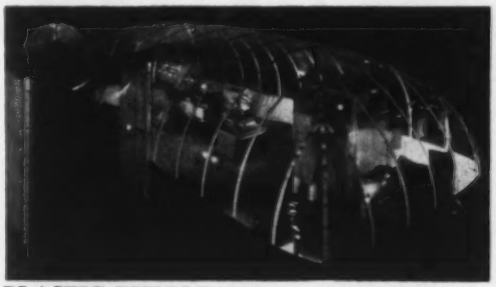
by superimposing combinations of vertical or horizontal patterns on plain base colors. Composed of frit and special pigments, the colors are permanently fused into the base metal. Weathering won't affect these colors.

Capitalize on Nitrogen?

Oxygen steelmaking is growing by leaps and bounds. And to keep pace with the demand for oxygen, more and more air-separation plants are springing up as a source of supply. This in turn can step up the availability of nitrogen—often a waste product of the air-separation process. Recent tests indicate that nitrogen, plus controlled amounts of oxygen and hydrogen, serves as a protective atmosphere in annealing furnaces. Properties of testpieces annealed in nitrogen equal those obtained with generated atmospheres.

Machine Isolation Ward

Space-age precision calls for new and ingenious manufacturing methods. For example, this plastic bubble controls environment during runoff and



PLASTIC BUBBLE: Aids machine-tool checkout.

inspection of precision machine tools. Supported by air pressure, it provides ideal conditions for balancing the operating characteristics of a machine tool and its tape-controlled system.

Sponge Deoxidizes Steel

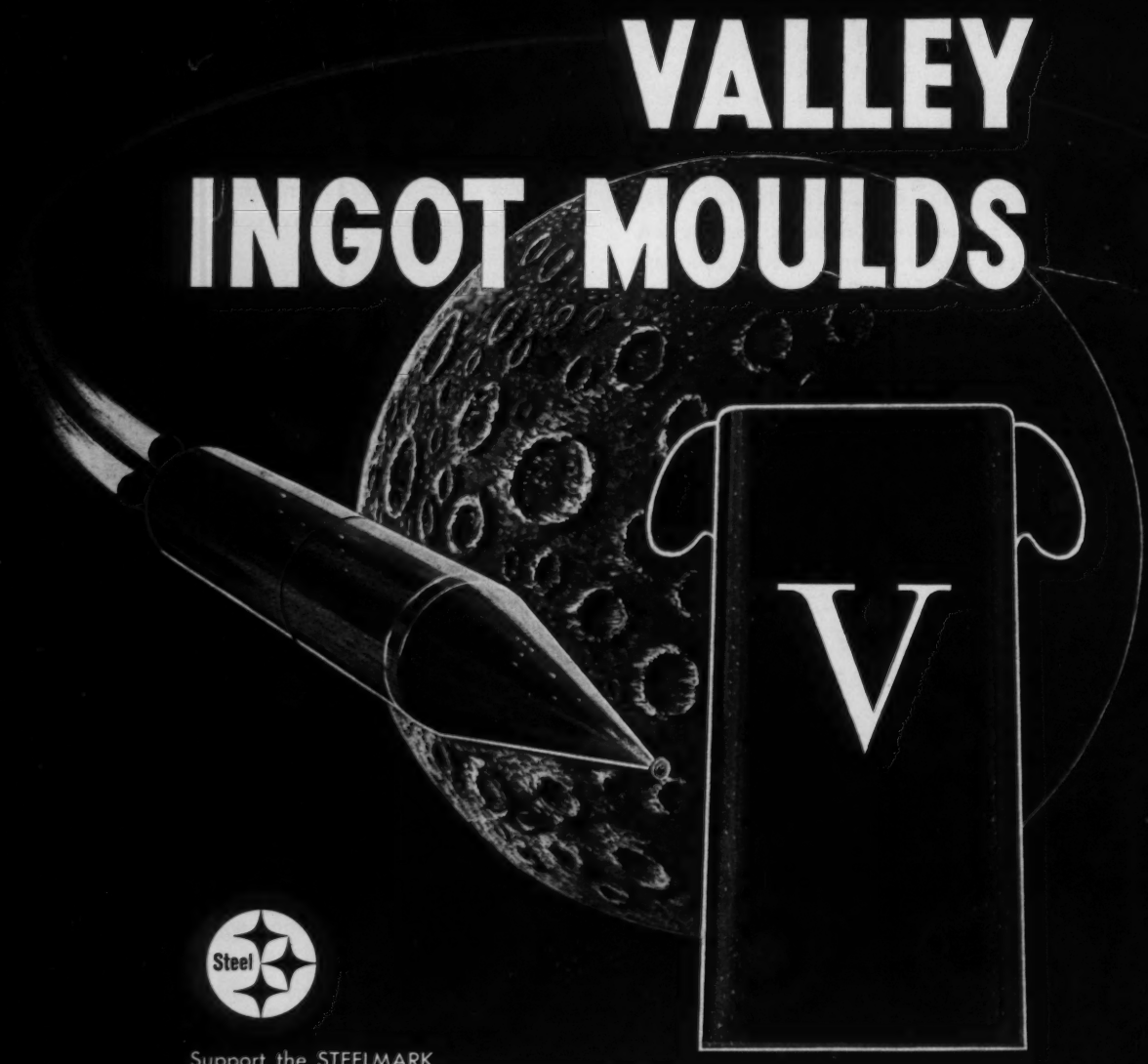
Titanium sponge has usurped the function of ferrotitanium in single-runner openhearth furances at Russia's Kuznetsk Metallurgical Combine. This sponge dissolves in the ladle much more readily than ferrotitanium. It also eliminates costly ingot rejects resulting from unsatisfactory chemical compositions. However, to prevent spontaneous ignition, the titanium sponge must be stored and shipped in closed metal containers.

Overaging Adds Ductility

To meet the need for a more-ductile galvanized sheet, Jones & Laughlin Steel Corp. is trying a new annealing treatment. After coating, a batch of the galvanized sheet is treated at temperatures up to 600°F. This is the upper limit since at higher heats, the zinc would be alloyed. Because of this boundary condition the treatment is called overaging rather than annealing.

For over 75 years steel has been poured into Valley Moulds, and now the new metals... used in space . . . . will also be poured into

VALLEY INGOT MOULDS



Steel

Support the STEELMARK

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GENERAL OFFICES: Hubbard, Ohio
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A Russian First?

Sir—I was amazed to read the article, "Soviets Weld Steel to Aluminum" in your September 14 issue. You credit Russia with another first which I herein dispute.

After reading the article, I find that the Russians are using practically the same process for which I have patent application, Serial No. 16409—Div. 14, March 21, 1960. I have also affidavits and samples dating back to January 1958 as proof and witness to my discovery and invention.—J. P. Shralleja, Lakewood, Calif.

Sir — You featured an article which states, "Soviets Weld Steel to Aluminum." (IA, Sept. 14, p. 181.) Then, you go on to say, "The Russians are the first to announce success in this area."

In 1949, I successfully joined aluminum to steel, using the tungsten arc process and, to put it frankly, was not too impressed over the results because of the lack of ductility in the joint.

There was considerably more development work accomplished and other procedures developed which indicated better results than those specified in your article.

I really don't believe the process the Russians claim as another FIRST has anything to offer the industry that hasn't been tried in the U. S. A. before.—Joseph LaBarbera, vice president, operations, The J. B. Beaird Co., Shreveport, La.

▪ We did not say that the Russians were the first to succeed in welding these dissimilar metals. We said they were the first to announce success. Why did we attach so much importance to this development? Because the Russians claimed to be using this technique in actual production.—Ed.

Steelmaking Explosion

▪ The third in The IRON AGE series, Metalworking's Technological Explosion: Steelmaking (Sept. 14), is attracting international reader interest. Following are some letters showing a cross-section of international and U. S. opinion.—Ed.

Sir—We should appreciate receiving one copy each of the following: Metalworking's Technological Explosion and Soviets Weld Steel to Aluminum.—V. Garibaldi, U. S. representative, Fiat Societa per Azioni, Torino, Italy.

Sir—Would you be so kind as to supply us with two reprints.—Horace Freeman, president, Freeman Corp., Cap De La Madeleine, P.Q., Canada.

Sir—It would be appreciated if you would be good enough to send us a reprint.—O. J. Kihle, Alcan International Ltd., Montreal, P.Q., Canada.

"You've made more calls than anyone else, cut your expense account in half and boosted your sales. Just what are you up to?"

HERBERT W. WESTEREN, Hayes Ass't Director of R & D, tells about the Hayes way to solve

VACUUM SINTERING

TEST IT! You bring your test compacts to the Hayes lab. where they can be heat treated in production-scale vacuum equipment under varying time/temperature/vacuum conditions. Here you prove BEFORE PURCHASE that your work is right for vacuum sintering, whether it's stainless steel, tungsten carbide, cermets, refractory metals, glass preforms, or other ferrous or non-ferrous materials. You also determine whether or not you need atmosphere-protected presintering — a frequent requirement in this type of processing.

DUPLICATE RESULTS! Next you work with our furnace applications engineers to obtain the exact VACU-MASTER® design you need, taking in consideration: size of workpieces, amount of production, fixturing, temperature range, degree of vacuum, heating and cooling cycles, type and volatility of sinter binder, evolved gases, etc. The lab-proved procedure takes form in a Vacu-Master design engineered for your job — the *right* heating elements and power, the *right* size of heating and cooling chambers, the *right* pumping system, the *right* controls and instrumentation.

Model VAC-50 Series Cubicle Vacu-Master, compact cold-wall vacuum furnace.

RESULTS? GUARANTEED! Hayes Vacu-Masters are right now sintering stainless steels at 2,150°F to 2,300°F (depending on size and analysis of work). They're sintering tungsten carbides at 3,000°F to 3,200°F. They're sintering glass preforms and other electronic components. They're treating titanium, hafnium, zirconium . . . AND THEY'LL TREAT YOUR WORK RIGHT!

TRY HAYES! Take advantage of our store of metallurgical know-how and experience-proved furnace designs. Write for VACU-MASTER vacuum furnace Bulletins 6010-B, 5709-B, 5709-A . . . or ask for a date to visit our lab. C. I. Hayes, Inc., 821 Wellington Ave., Cranston 10, R. I.

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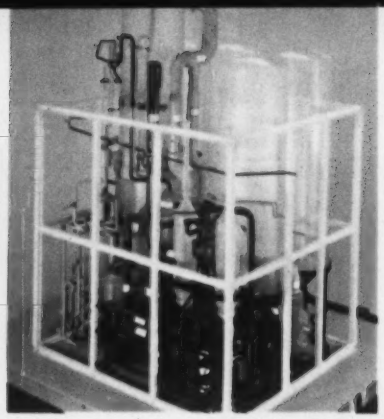
It pays to see Hayes for metallurgical guidance, lab. facilities, furnaces, atmosphere generators, gas and liquid dryers, pHayes-Master (TM) power controls, induction generators.

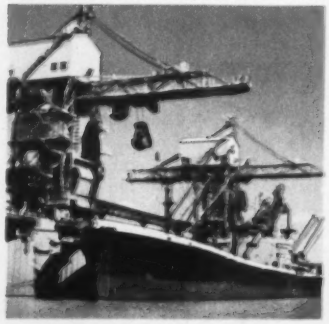
ILLINOIS: This Dravo-Lurgi sinter plant has rated capacity of 3900 tons per day. Over 45% of new U.S. sinter capacity added by steel industry in past five years are Dravo-Lurgi plants. A second Dravo-Lurgi pelletizing plant is being added for a large metal-producing company. Mail coupon for information on sintering, pelletizing, briquetting, beneficiation or other ore processing services.

MINNESOTA: Taconite shipping facility—2,334-foot dock, harbor and breakwater — built by Dravo on Lake Superior.

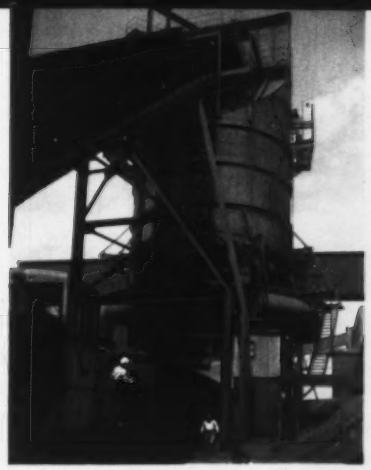


MICHIGAN: Engineering model of the cold box for 280-ton-per-day oxygen plant, now under construction for steel division of a major auto maker, will be first low pressure plant in U.S. to produce simultaneously gaseous and liquid oxygen without high pressure cycle. Dravo designs and builds air and gas separation plants under arrangement with Linde AG of Munich, Germany. Dravo turn-key services also include power and steam plants, water pumping and treatment stations, other plant utilities. Send the coupon for data.

LOUISIANA: Dravo-built twin unloaders and dock handle variety of materials at versatile ship/barge facility on Lower Mississippi. Rugged, efficient materials handling equipment can reduce costs of unloading ore, coal, other bulk commodities and containerized cargo for water-side plants and port installations. Send coupon for details.



PENNSYLVANIA: Dravo *Tru-weld* grating is produced by modern, highly automated equipment. It is used on all types of applications where open steel flooring and stairs are needed; is available direct or from distributors throughout U.S., in standard panels or fabricated. Check coupon for information.



NEW YORK: New forced air, stationary cooler, new sinter breaker, hot screening facilities and other plant modifications helped major steel producer improve sinter quality and production. Similar programs are underway for two other existing plants. Check coupon for information on stationary, induced-draft circular or straight-line coolers, breakers, screens or sinter plant modernization services.

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Pennsylvania

Process Modernization in
New York

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- ☐ Ore Beneficiation
- ☐ Oxygen Plants
- ☐ Mill Lubrication
- ☐ Turbo Blowers
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- ☐ Ore Bridges
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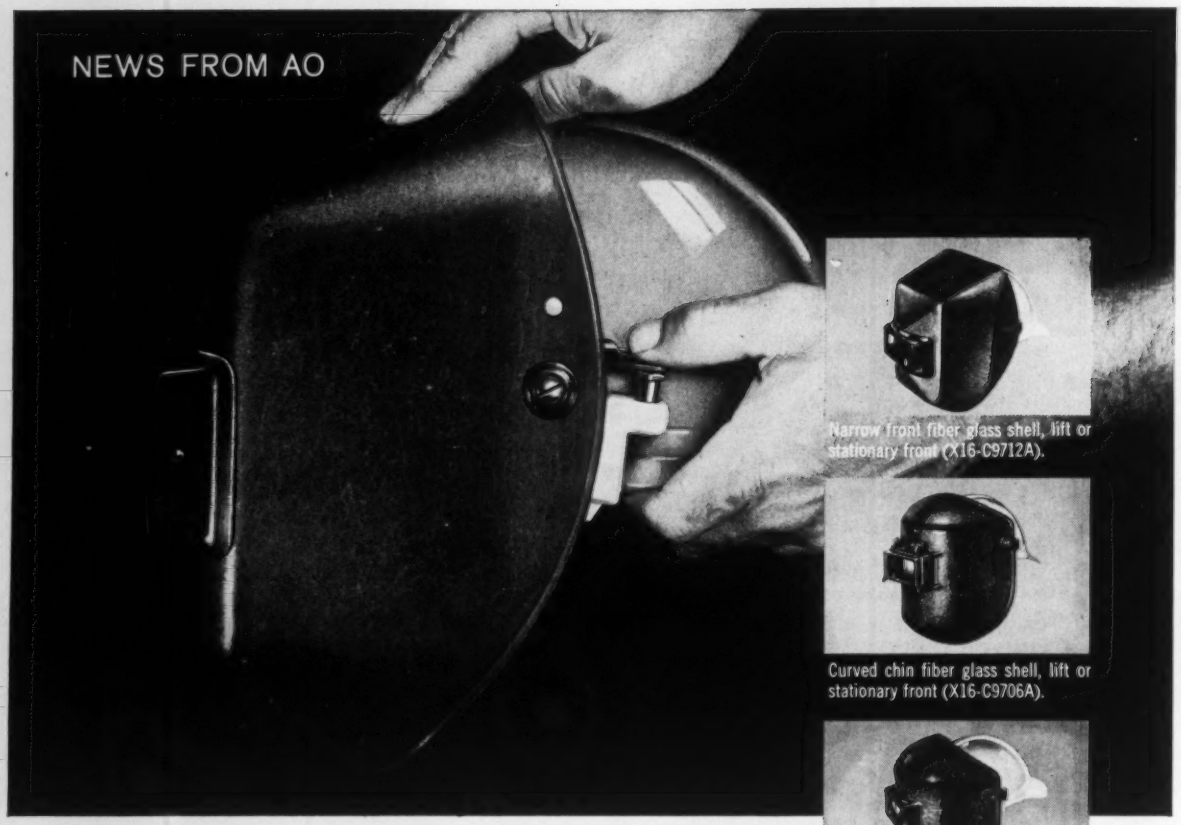
DRAVO

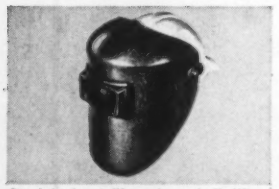
NEWS FROM AO



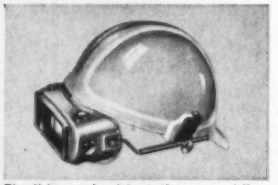
Narrow front fiber glass shell, lift or stationary front (X16-C9712A).

Curved chin fiber glass shell, lift or stationary front (X16-C9706A).

Curved chin fiber glass shell, heat-reflective coating, lift or stationary front (X16-C9702WA).



Straight front fiber glass shell, lift or stationary front (X16-C9602A).



Flexible mask with stationary welding plate (X16-C488).

Welders' coverglas goggles (X16-C329B).

Now... One Easy-to-Use Clip Fastens Any of These Attachments To an AO Safety Cap

You can use any of these accessories with regular AO Dura-Guard safety caps . . . all you need is a pair of AO's simple X30 clip-on attachment holders. Molded of nylon, they slide easily over the side brim and are secured by nylon set screws which hold them tight. No drilling. No holes. No need to stock caps with attachments. Just apply clips to regular stock of caps.

Choose from 10 welding helmet models (both fiber glass and vulcanized fiber, lift or stationary fronts), flexible mask welding goggles, and welders' and chippers' coverglas goggles. All are quickly and simply attached to the Dura-Guard safety cap by slipping the attachment post into the hole provided. It locks securely into position, can be detached in seconds when you want to remove it.

Because they are all-plastic, the X30 clips insulate metal attachment parts, help retain the Dura-Guard cap's dielectric properties. You can get complete details on all these new accessory helmets and goggles by contacting your AO Safety Products Representative or writing direct.

Your Surest Protection . . . AO SURE-GUARD Products

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SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASSACHUSETTS

Business as Usual?

As you read about the Berlin crisis do you occasionally wonder what makes the city tick? What sort of industry does West Berlin have? How do industry people feel about the current state of affairs. Do they believe in us, or are they leaving in droves? And how did the border closing affect metalworking plants there?

These questions occurred to us. We believe that people understand things better when they have a personal frame of reference; when they can relate them to things they know.

Seek Answers—Berlin, it seemed to us, would be in sharper focus if we met some West Berlin metalworking executives and tried for answers to some of these questions.

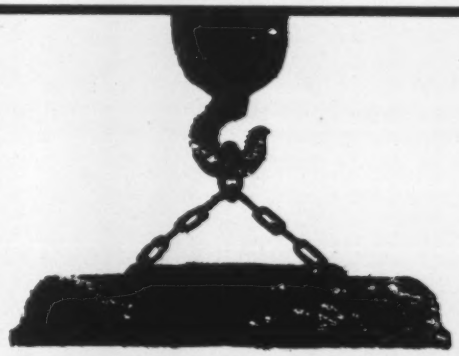
The result is Editor George Sullivan's report on p 41. No attempt to cover the ground the dailies do so well; just an effort to bring you a little closer to the city.

Memorial—About the photos on this page: Men on the street next to the funeral wreaths are at what has become a memorial in the current crisis. The apartment building behind them faces West, but the rooms are in East Berlin.

When the Reds began to seal all lower floor openings with cinder block, one Ida Seikmann, 59, tossed some bedclothes from her fourth floor apartment, jumped, missed them and died. A 6-ft wooden pyramid has since been placed on the spot.

Warning Sign—The other shows Editor Sullivan at the Brandenberg Gate. Just behind the sign warning "You are now leaving West Berlin" is a string of barbed wire. It was put up by the West to keep West Berliners from getting too close to the border where incidents might erupt. "Even to get where I was standing," he reports, "I had to show my press card to a British soldier and a West Berlin policeman."

BERLIN HOT SPOTS: Editor Sullivan at Brandenberg Gate (top) and memorial at apartment house marking spot where East German resident tried to jump to freedom and died.



FOR QUICKER PICK-UPS ...

Heavy-duty hoisting equipment re-engineered by POLLOCK—and rebuilt for speed. POLLOCK puts new life in a used crane's performance by increasing bridge speeds, lifting speeds. By installing larger motors, new A.C. electrical systems. By replacing worn bearings with smooth, modern, anti-friction bearings. Cranes, cabs, trolleys, bridges—all custom re-designed to meet the requirements of your shop.

POLLOCK

ENGINEERING CO., INC.

POTTSTOWN, PENNSYLVANIA

Test salt bath neutrality quicker with a razor blade

Liquid salt baths have long been recognized for their stability, freedom from decarb and the protection they afford the surface being treated.

Regardless of the inherent stability of molten salts, however, they do occasionally become contaminated which may result in decarburization. When this happens the metallurgist can use a simple homespun method to determine the bath's neutrality.

The hard way is a metallographic check, which involves cleaning, sectioning, mounting, polishing, etching and examining a specimen under the microscope. This is costly and time-consuming.

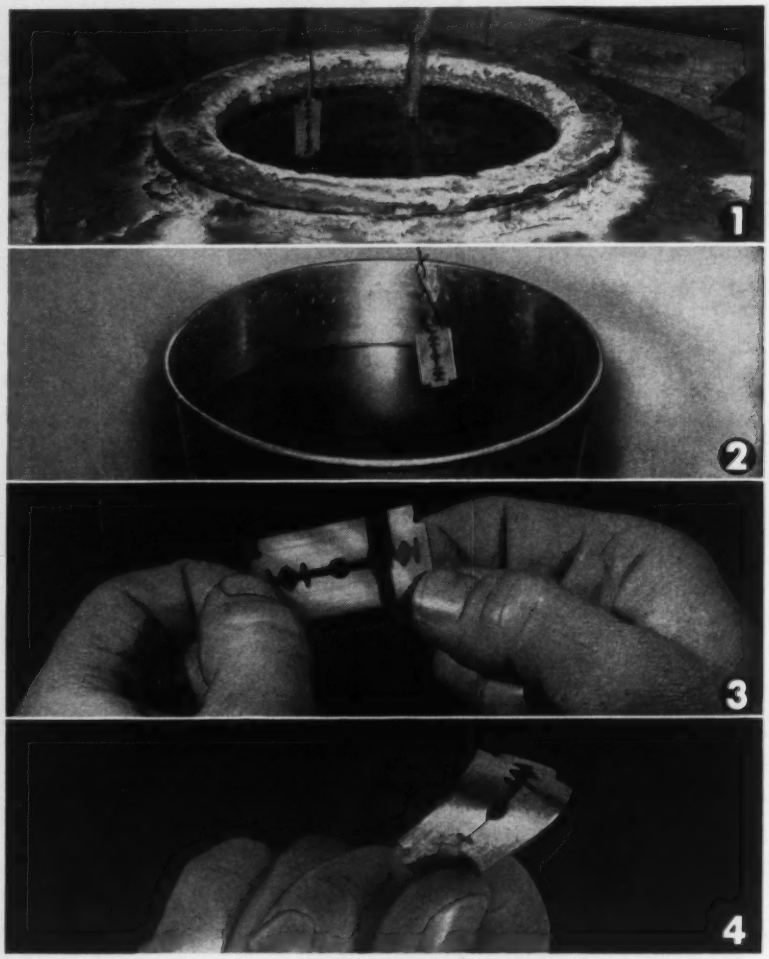
The simple way requires only an old razor blade, the double-edge type, and not one made of austenitic stainless steel. This method has been found very practical and accurate.

The blade is hung on a wire and dipped into the hardening bath of molten salt (photo no. 1), leaving it immersed for about the same time as the work being regularly heated there, and at the same temperature. Then it is quenched rapidly in water (photo no. 2).

Now for the simple bending and breaking test. Hold the blade in two hands and bend it. If it breaks with a brittle fracture (photo no. 3), the bath is neutral—no tendency to decarb. But if it bends before breaking (photo no. 4), this evidence of ductility indicates that the bath is decarburizing.

The ductility or absence of ductility indicates the condition of the salt bath. If the blade is ductile and can be bent 90° or 180° before fracturing, the steel is partially or completely decarburized. If the blade is not ductile but breaks with a brittle fracture, the bath is in good condition and work may be processed satisfactorily.

This simple test saves much time and the need for expensive metallographic equipment. It is not 100% sure, but our metallurgical friends find it very helpful for a quick and revealing test of the effect of molten salt on metal.



Heat treaters have come to expect the best from Houghton. And along with product purity, speedy delivery and well packaged materials "the best" includes assistance and cost-saving "hints" such as the razor blade test. Houghton makes and services salts for carburizing, hardening, annealing, tempering, quenching and nitriding. For the Salt Bath Catalog, write E. F. Houghton & Co., 303 W. Lehigh Avenue, Philadelphia 33, Pa.

Houghton

INDUSTRY'S PARTNER IN PRODUCTION

COMING EXHIBITS

American Society for Metals—Metal Show, Oct. 21-27, Detroit. Society headquarters, Metals Park, Novelty, O.

Fleet Maintenance Exposition—Oct. 23-26, New York Coliseum.

Metal Show — Oct. 23-27, Cobo Hall, Detroit. American Society for Metals.

Packaging Machinery Show—Nov. 7-10, Cobo Hall Detroit. (Packaging Machinery Mfrs. Institute, 342 Madison Ave., New York 17.)

Marine Supplies & Equipment Show—Nov. 15-17, Hotel Roosevelt, New York City.

MEETINGS

OCTOBER

Conveyor Equipment Manufacturers Assn.—28th Annual meeting, Oct. 7-10, Ponte Vedra Inn, Ponte Vedra, Fla. Assn. headquarters, No. 1 Thomas Circle, Washington, D. C.

Rolling Mill Machinery & Equipment Assn.—Annual meeting, Oct. 9, Duquesne Club, Pittsburgh. Assn. headquarters, Farmers Bank Bldg., Pittsburgh.

Rail Steel Bar Assn.—Semi-annual meeting, Oct. 9-10, Drake Hotel Chicago. Assn. headquarters, 38 South Dearborn St., Chicago.

American Standards Assn. — 12th National conference, Oct. 10-12, Rice Hotel, Houston. Assn. headquarters, 70 E. 45th St., New York.

National Screw Machine Products Assn. — Fall membership meeting, Oct. 12-15, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, 2860 E. 130th St., Cleveland.

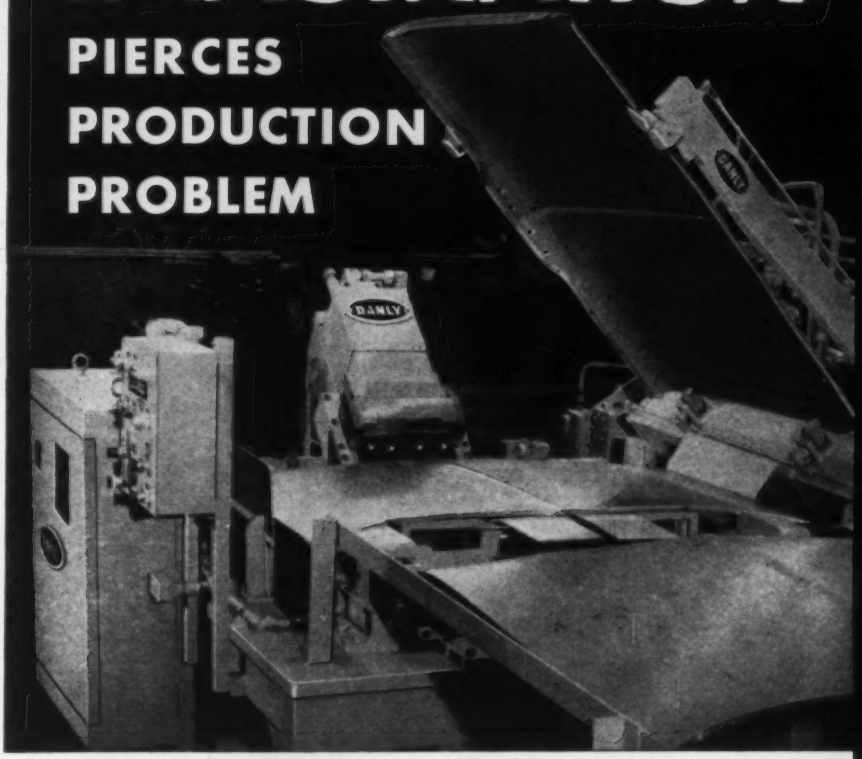
American Society of Lubrication Engineers—Conference, Oct. 17-19, Hotel Morrison, Chicago. Society headquarters, 5 North Wabash Ave., Chicago.

(Continued on P. 26)

DANLY

IMAGINATION

PIERCES PRODUCTION PROBLEM



This Hydraulic Piercing and Turnover Unit, designed and built by Danly for a major automobile manufacturer, automatically pierces ornament mounting holes in hoods as they come off the forming press. And it handles 600 hoods per hour! Then it turns them over for the next operation. Versatile! Practical, too—because it eliminates the need of a press for piercing and a separate turnover unit. Typical of the Danly engineering that applies hydraulics and imagination to speed production and cut costs.

Danly's complete line of Hydraulic Platen Presses and hydraulic cylinders offers you the tools to solve virtually any compression molding, bonding, laminating, trimming, extruding or piercing problem in processing metal, plastics, or rubber. They're precision units with accurately machined platen faces, positive parallel platen closure, uniform pressure distribution and extra, rigid strength. And Danly's versatile engineering adapts these tools to *your specific needs.*

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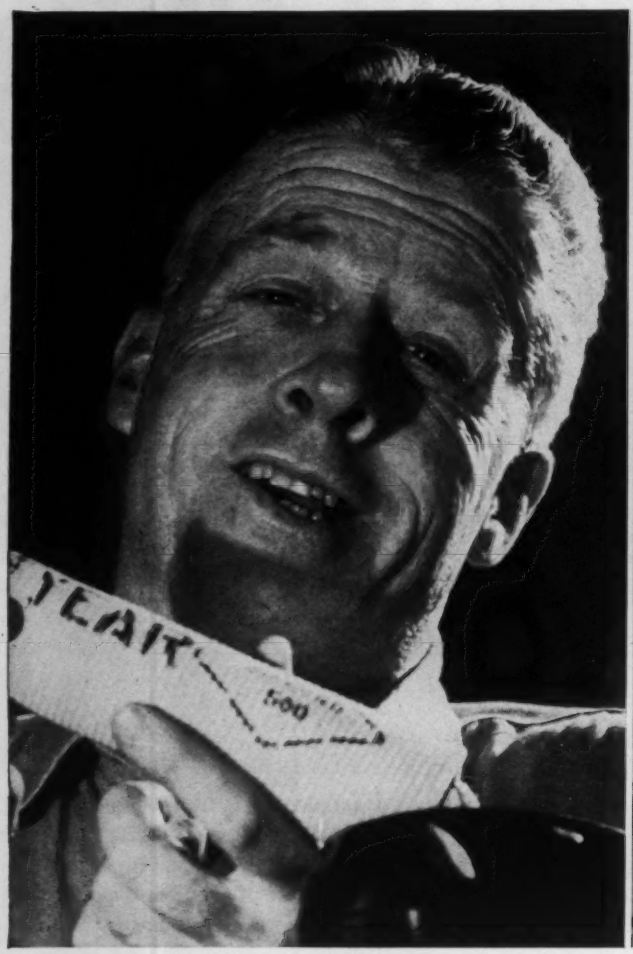
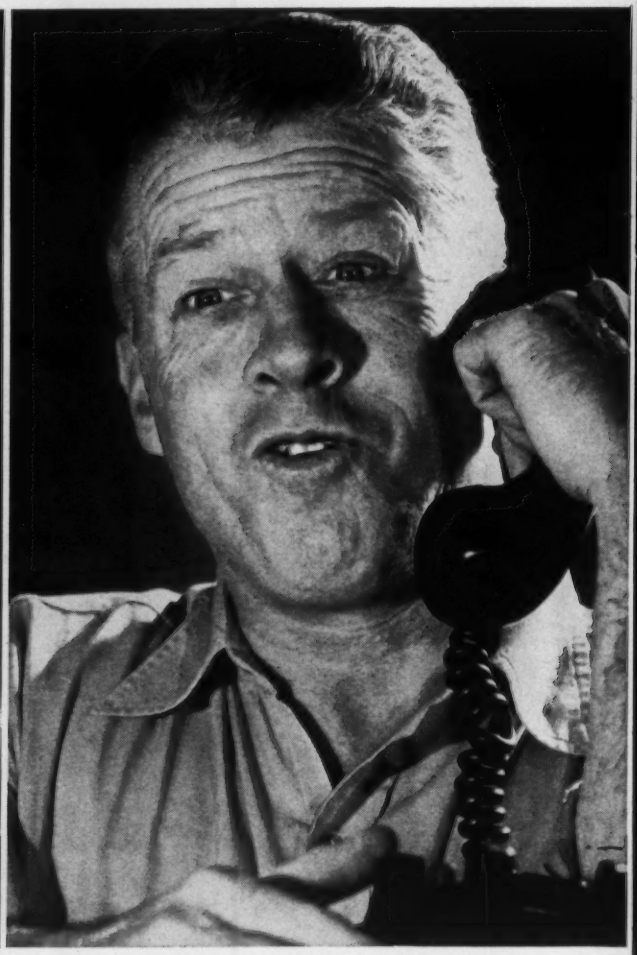
GOODYEAR

Why not buy hose





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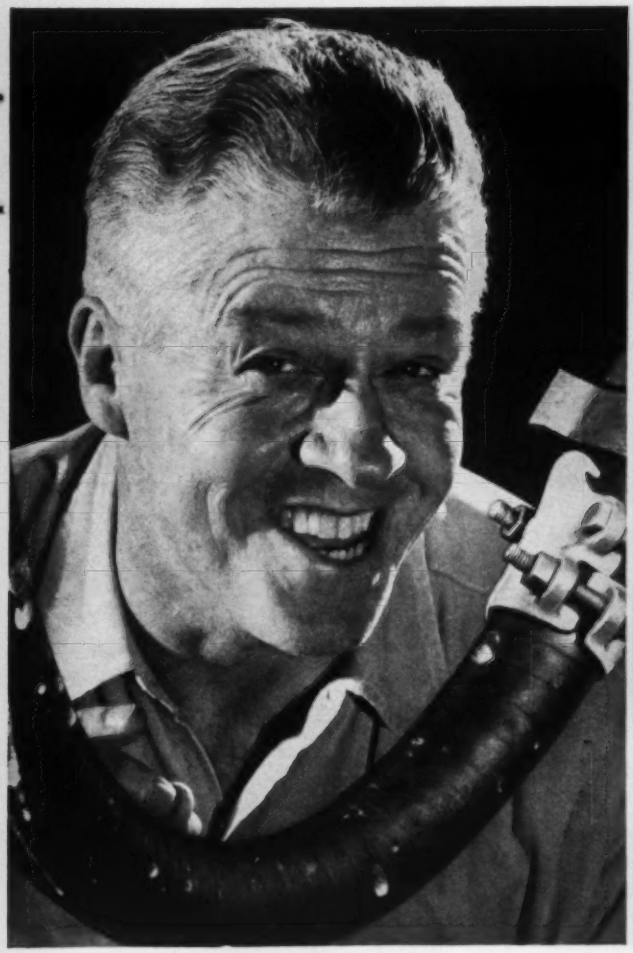
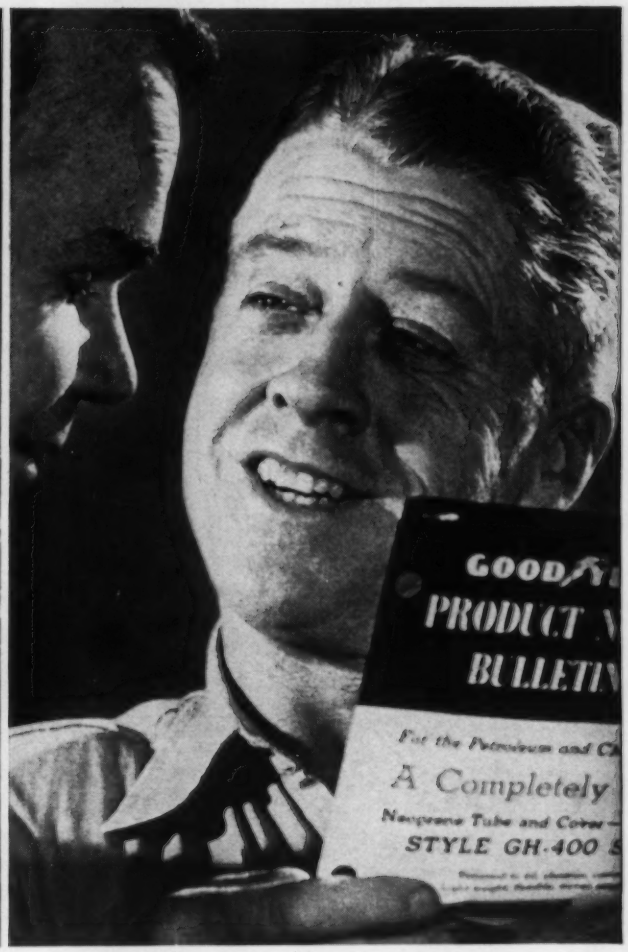
For the right hose... at the right place... at your Goodyear Distributor... first in service

Lots of good things come from **GOOD**

the easy, Goodyear way?





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YOU GET EXPERT ADVICE
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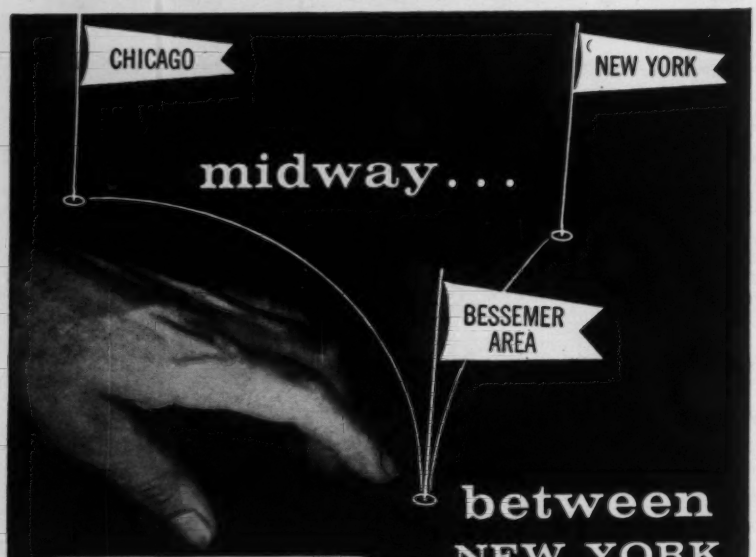
Or write Goodyear, Industrial Products Division, Akron 16, Ohio

GOODYEAR INDUSTRIAL PRODUCTS

another Bessemer location advantage



The Bessemer Area is one of the world's greatest industrial markets with a $5-billion primary and fabricated metal output. Reach out 125 miles—and you tap a lucrative market of over 8 million consumers.

Other Bessemer Area advantages are: 24-hour delivery of steel and other basic materials; extensive deposits of coal, limestone, clay and aggregates; a labor force of over a million widely diversified as to skill; choice of unexcelled, adaptable, flood-free sites served by abundant water, gas and power.

Investigate today! Write or phone for location factors on any of the suitable plant sites indicated by stars on the map. No obligation. Strictly confidential.

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MEETINGS

(Continued from P. 23)

Gray Iron Founders' Society—33rd Annual meeting, Oct. 18-20, Royal York Hotel, Toronto. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

Foundry Equipment Manufacturers Assn., Inc.—Meeting, Oct. 19-21, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, No. 1 Thomas Circle, Washington, D. C.

Magnesium Assn. — Annual convention, Oct. 22-24, Belmont Plaza, New York. Assn. headquarters, 122 E. 42nd St., New York.

National Assn. of Sheet Metal Distributors — Annual meeting, Oct. 22-25, Hotel Dennis, Atlantic City, N. J. Assn. headquarters, 1900 Arch St., Phila.

American Coke & Coal Chemical Institute — Annual meeting, Oct. 23-24, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 711 Fourteenth St., N. W., Washington, D. C.

Wire Assn. — Annual convention, Oct. 23-26, French-Lick Sheraton, French Lick, Ind. Assn. headquarters, 453 Main St., Stamford, Conn.

Society for Non-Destructive Testing—National convention, Oct. 23-27, Detroit. Society headquarters, 1109 Hinman St., Evanston, Ill.

National Tool & Die Manufacturers Assn. — Annual convention, Oct. 24-28, Huntington-Sheraton Hotel, Pasadena, Calif. Assn. headquarters, 907 Public Square Bldg., Cleveland.

American Society of Tool Engineers — Semi-annual conference, Oct. 26-27, The Royal York Hotel, Toronto. Society headquarters, 10700 Puritan Ave., Detroit.

Industrial Truck Assn. — Annual meeting, Oct. 29-31, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, One Gateway Center, Pittsburgh.

Gary adds fifth Wean Line to step up pickling capacity

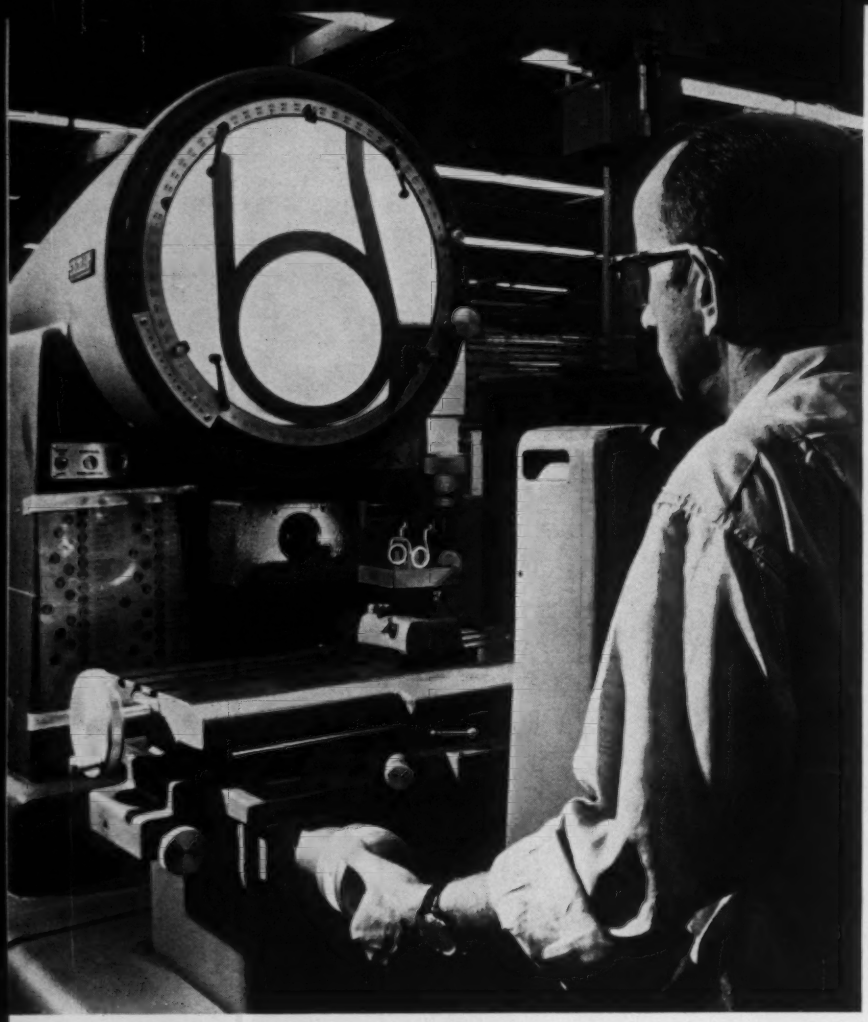
United States Steel Corporation recently installed this new Wean pickling line to give its Gary, Indiana plant increased capacity in its pickling department. The new line incorporates modern design features that make higher operating speeds possible without increasing the physical length of the pickling tanks.

This has been principally accomplished through the addition of a secondary scale breaking function, performed by a temper mill and two bridles. Another factor in increasing speed is the advance coil preparation station which trims end scrap before coils are fed into the line. In combination, the design improvements give the Gary No. 5 line entry speeds up to 2,000 fpm and pickling tank section speeds to 1,000 fpm. Entering coils of 62″ O.D. and 25,000 lbs. maximum can be built to 78″ O.D., 60,000 lb. coils.

This ultra-modern installation is one of the 85 pickle lines Wean has designed to serve the steel industry. It represents over 30 years of Wean's engineering experience in developing high-speed coil processing lines that serve every major American steel manufacturer—an unequalled background of "creative engineering" to serve you.

WEAN

THE WEAN ENGINEERING COMPANY, INC. • WARREN, OHIO



A profile of wire forming quality is cast by clutch vibration dampener spring on contour projector in Cuyahoga Products Corp's. quality control laboratory. Function of double-torsion spring is to soak up rattles in auto clutch. It's made from Pittsburgh Steel Company's oil tempered wire.

Cuyahoga Products Corp. Gets . . .

Long Production Runs—Precision Springs From Pittsburgh Steel Wire

Controlling the dynamic forces inside a clutch takes a special degree of strength and toughness in high carbon wire springs.

Cuyahoga Products Corp. of Charlotte, N. C., helps automotive clutch manufacturers do the job with pressure-plate and vibration dampener springs made from oil tempered wire.

Pittsburgh Steel Company is one of Cuyahoga's principal suppliers of oil tempered wire—as well as hard drawn MB spring wire, low carbon bright and galvanized wires.

Cuyahoga Products ranks as the South's biggest manufacturer of springs and wire forms. Following consolidation with American Spring of Holly Inc., Holly, Mich., it's newly installed in a modern, 400-man plant in Charlotte's Arrowood industrial district.

Automotive applications count for a substantial part of Cuyahoga's production.

And for measurement of Pittsburgh Steel wire quality, there's no better yardstick than consistent performance in the long production runs of precision-formed automotive springs.

Why does Cuyahoga specify oil tempered wire for its hundreds of applications of this type? John L. Moran, Vice President—Manufacturing says it's: ". . . because oil tempered has the physical properties necessary for extremely precise forming, and for greater fatigue life under high stresses."

Cuyahoga's supervisor of inspection and quality control added:

"In our sampling program, we'll allow a supplier a small margin of deviation. Then if their wire exceeds that, we correct matters simply by switching to another source.

"Pittsburgh Steel's wire shows up very well. Offhand, I can't recall any complaints about it—either here or when we were located in Cleveland."

Clutch plate—pressure springs are just one of thousands of types of springs and wire forms Cuyahoga is called on to produce.

But they represent a typical use of Pittsburgh Steel's oil tempered wire in jobs where precision form, uniform strength and faithful performance under high stress are critical.

Surface quality, ductility and tensile strength (narrower than commercial tolerances) are vital to Cuyahoga from standpoints of trouble-free production and quality control.

Cuyahoga produces one particular size of pressure-plate spring for a big automotive clutch manufacturer from Pittsburgh Steel's .177-inch oil tempered wire.

With closed ends ground square and chamfered, the spring contains precisely 5.6 coils, including 3.46 active coils, with a free length of 1.274 inches and an .875 inch O.D.

Compressed to 1.069 inches, each of five consecutive samples must register a load of 233-253 pounds in quality control load tests made every hour on production runs, as well as at each set-up and coil change.

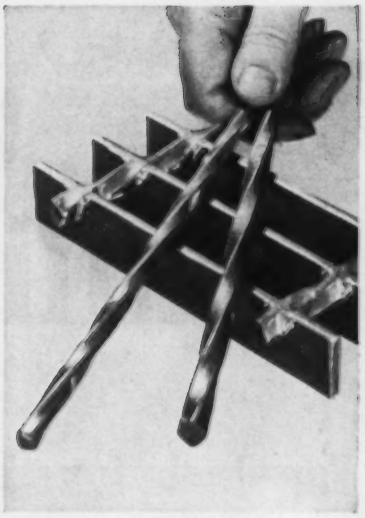
Because a friction clutch becomes a veritable beehive in operation, Cuyahoga also calls on oil tempered wire for toughness and fatigue resistance necessary to soak up clutch vibrations.

Produced on a 4-slide machine from .091 inch O.T. wire, this vibration dampener consists of a $2\frac{3}{16}$ inch double-torsion spring containing two $\frac{7}{8}$ inch O.D. turns and mounting lugs at each end.

Mounted in sets of six to provide a precise $\frac{13}{16}$ inch gap between clutch cover and pressure plate, dampener springs serve to eliminate a major source of irritating rattles.

Investigate Pittsburgh Steel's oil tempered wire for your own spring applications where steady, reliable performance are "musts" for profitable production. Helpful service and quick delivery from ample wire stocks are part of the Pittsburgh Steel package, too. Just contact one of the district offices listed on the adjoining page.

One of 65 types of auto door lock linkage systems produced by Cuyahoga Products, lock rod above is produced on specially adapted 4-slide machine at rate of 2,000 pieces per hour from .160 bright basic galvanized wire—much of it supplied by Pittsburgh Steel Company.



Ardox, Spiralled Wire Is Designed to Save You Time and Money

Production benefits grow quickly into dollar savings when you use spiralled Ardox wire, a new product from Pittsburgh Steel Co. This preshaped wire, designed for industrial grating and ornamental iron applications, is also delivered ready for fabrication into furniture and decorative housewares.

The uniform spiralled shape is achieved at the mill. Costly, time-consuming twisting operations in your plant are eliminated. You save time, labor and equipment. Because Ardox is cold drawn into its final shape, basic metallurgical qualities remain unchanged and you get more uniform strength.

Special dies used in the cold drawing process give Ardox a fine surface finish. Spirals are more precise and uniform. Painted or plated Ardox looks better and lasts longer. A special, double spiralled patterned surface design is also available.

Made of low carbon steel, or to your own analysis, if desired, Ardox is provided in any desired straight lengths. Diameters to your specifications.

Precise forming, long service under tough conditions are required of clutch plate pressure springs. Made by Cuyahoga from Pittsburgh Steel's .177 oil tempered wire, springs above are being ground square and chamfered.

Fatigue life, toughness of Pittsburgh Steel oil tempered wire are ideal for the job this clutch anti-rattle spring must perform.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

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Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
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Steel

Why do we say fulfills the promise

For single function or automated system... our Systemation concept is fitted to your actual needs

In crude definition, automation merely means "to make automatic." In implication, however, automation carries strong promise of low-cost production. It is in the area of lowering costs, some feel, that automation has most frequently missed its potential.

The engineering genius which can concoct sophisticated circuitry . . . join computers, primary detectors, instruments, processing equipment . . . too frequently overlooks the fundamentals of thorough *process knowledge* and such basic problems as the maintenance costs associated with automated systems.

Prudent investment of key importance

The *Systemation* concept is built around lowering *your* processing costs, increasing *your* productivity, improving *your* quality control. The starting point is not "what can be automated" but rather "what automation can be economically justified under your conditions of production."

Allis-Chalmers is thoroughly qualified to help you make *prudent* investment decisions about equipment and instrumentation.

Balanced judgment in depth

Long a supplier of control systems, a broad line of industrial processing and electrical generation, transmission, distribution and utilization equipment, A-C has an intimate knowledge of industrial processes. With the acquisition of Consolidated Systems Corporation last year, Allis-Chalmers extended its ability in the areas of data gathering, handling and utilization. CSC provides such experience acquired from more than 500 successful system projects.

Recently, Allis-Chalmers, Consolidated Systems and International Business Machines Corporation effected a nonexclusive mutual agreement relating to the production and marketing of automated control systems and processes.

For the typical system, Allis-Chalmers takes functional responsibility for the system using IBM data processing computer equipment, CSC specially engineered data conditioning equipment and instrumentation, and A-C basic and auxiliary industrial processing equipment. Now, Allis-Chalmers brings a balance of specialized judgments to bear on your problems . . . drawn on significant experience . . . to make major "contributions to the art" in many phases of *Systemation* and help you be sure before you invest.

Feasibility study shows opportunity

Your first step to Systemation *is a thorough feasibility study which spells out your opportunities for savings and puts a clear figure on the costs. Call or wire your nearest A-C office, or the Industrial Equipment Division, Allis-Chalmers, Milwaukee 1, Wis.*

Systemation is an Allis-Chalmers servicemark.

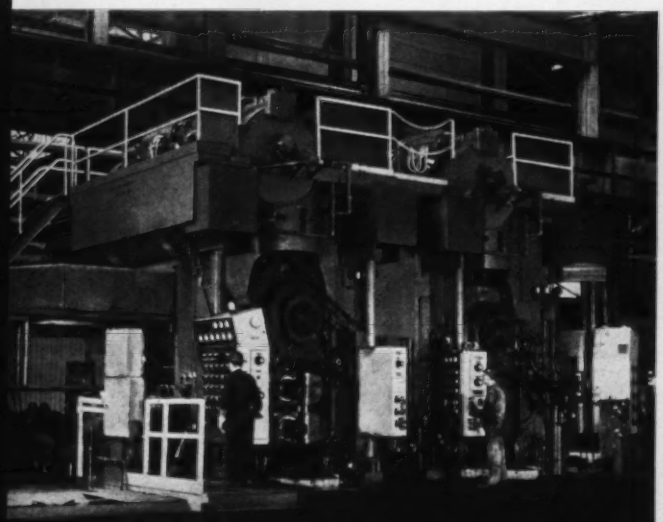
Systemation*

pays its way

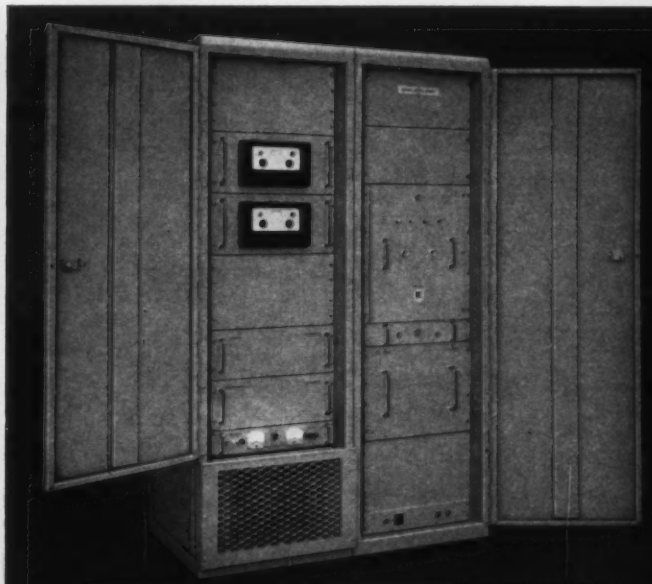
ALLIS-CHALMERS

A-1531

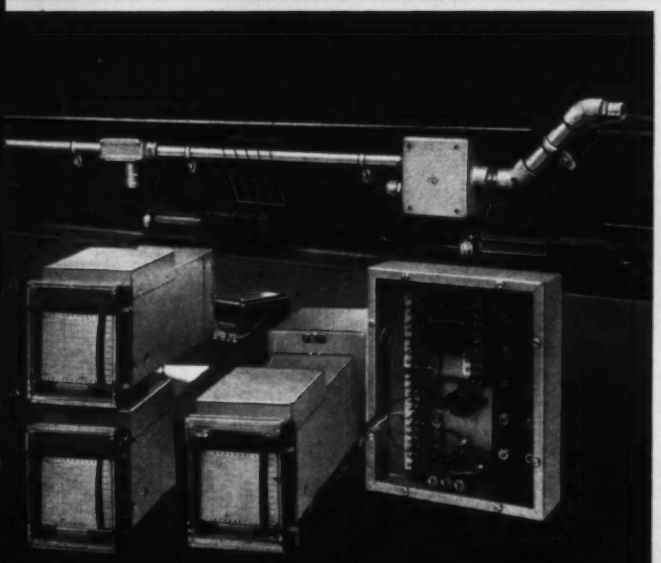
Systemation of automation?



HIGH SPEED TEMPER MILL features include: automatic digital extensiometer to indicate strip extension (hardness pickup); automatic slowdown for rolling maximum length at rolling speed, yet prevent mandrel explosion or tail-end roll damage.



PRECISE AUTOMATIC GAUGE CONTROL for thin tin with automatic screw reset.



AUTOMATIC BED DEPTH CONTROL for traveling grate in GRATE-KILN iron ore pelletizing process.

CENTRALIZED CONTROL ROOM for generating plant using one computer to automatically control two units for start-up, operation and shutdown.

Which of these parts should be investment cast?

...*All* the parts except the milling machine collet at the top right – which is a "natural" for conventional lathe work. Even the helical impeller the men are examining is best made as an investment casting – the helix is undercut in such a way that no cutting tool could reach inside to remove the metal.

"Naturals" for investment casting are usually parts that are too intricate to be made economically by any other process, or involve alloys or quantities that make them impractical to produce by other methods. In other words, when it looks as if you might have to sacrifice a design because its complexity makes the cost prohibitive, or forego a preferred alloy because it is difficult to machine, then it's time to take a long, hard look at investment casting.

But . . . it's not always as easy as it sounds to spot the parts that are "made" for investment casting. That's where the Arwood sales engineer comes in. He knows Arwood expects him to show a customer how to get the most from the process. To help keep your cost down he may have to suggest a filleted radius here . . . or a tolerance opened up there. Then too, on occasion he may readily have to admit the part should not be investment cast at all. However, he also knows that if you just can't have the part made any other way, Arwood will go all the way down the line to have it investment cast for you.

Our five plants cast every castable metal and alloy, including magnesium and superalloys. Each has its own research, tooling, quality control and production facilities. In short, if it can be investment cast, we can investment cast it.

Machine the simple . . . cast the complex

A complete service from design through tooling, production and finish machining. Seventy-one engineering representatives from coast to coast.

arwood

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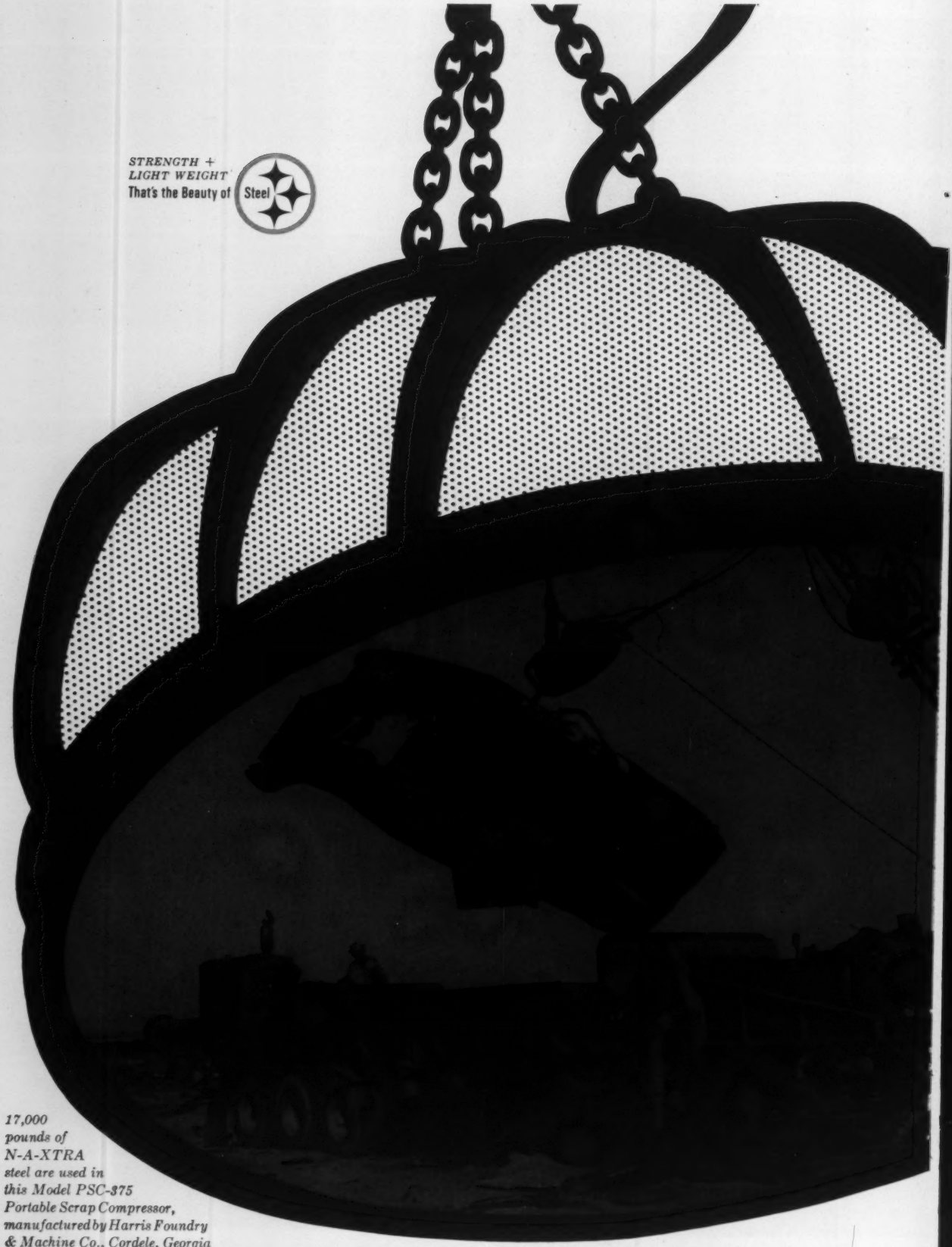
PLANTS IN BROOKLYN, N. Y.; TILTON, N. H.; GROTON, CONN.; LOS ANGELES AND LA VERNE, CALIF.

LIKE TO LEARN MORE ABOUT INVESTMENT CASTING?

Write us for a complimentary copy of our 44-page manual, "Practical Guide to Investment Casting." Among other sections it includes practical tips on designing for investment casting, as well as analyses and physical and mechanical properties of all the metals and alloys cast by Arwood.

STRENGTH + LIGHT WEIGHT
That's the Beauty of Steel



17,000 pounds of N-A-XTRA steel are used in this Model PSC-375 Portable Scrap Compressor, manufactured by Harris Foundry & Machine Co., Cordele, Georgia

STRENGTH + LIGHT WEIGHT OF

N-A-XTRA

HIGH-STRENGTH STEEL SOLVES PORTABLE SCRAP COMPRESSOR PROBLEM

This unique portable scrap compressor can squeeze an entire auto body into a 21" x 36" x 24" bale of 20% dense steel scrap, using a ram pressure of 375 tons. Designed to be hauled from job to job by a conventional truck-tractor, it goes to work in outlying wrecking yards, compressing bulky scrap into marketable bales that can be shipped economically.

Because it must be moved over the highway and meet established load limits, a pressing problem in designing the PSC-375 was weight. Mild carbon steel with the required strength would weigh too much. N-A-XTRA high-strength steel solved the problem. It fully met all strength and fabrication requirements, yet kept total unit weight within acceptable limits for portability.

Portability may not be the controlling factor in your product—but the same steel that solved this problem is the one to remember when only the strongest steel will do. Pound for pound, N-A-XTRA steels are nearly three times stronger than mild carbon steel. Rugged conditions, heavy loads and weight-saving construction—in such applications, for example, as heavy machinery and pressure vessels—are challenges that N-A-XTRA is designed to meet.

With excellent weldability, formability, and toughness even at subnormal temperatures, N-A-XTRA low carbon, extra strength alloy steels give superior results with conventional fabricating methods, including cold forming, gas cutting, shearing and machining. N-A-XTRA high-strength steels are available in four levels of minimum yield strength, from 80,000 to 110,000 psi, and in sizes ranging from ⅛" to 1" thick, up to 72" wide and up to 35' long. For further information, write Product Development, Dept. IA-12, Great Lakes Steel Corp., Detroit 29, Michigan.

DESIGN NOTE: Model PSC-375, Portable Scrap Compressor, uses N-A-XTRA 100 (minimum yield strength, 100,000 psi) in engine and tank mounts, bed and side ribbing, arm housings and end housing. Sizes—¼", ⅜", ½", ¾" and 1" thick. Fabrication followed standard gas cutting and welding procedures.

a product of

GREAT LAKES STEEL

Detroit 29, Michigan

N-A-XTRA STEELS ARE AVAILABLE AT THESE STEEL SERVICE CENTERS

Benedict-Miller, Inc. Lyndhurst, New Jersey	Joseph Demsey Co. Cleveland, Ohio	Ducommun Metals & Supply Co. Los Angeles, California
Interstate Steel Co. Des Plaines, Illinois	Lockhart Iron & Steel Co. Pittsburgh, Pennsylvania	Marsh Steel & Aluminum Co. Kansas City, Missouri
O'Neal Steel, Inc. Birmingham, Alabama	Salt Lake Hardware Co. Salt Lake City, Utah	A. C. Leslie & Company, Ltd. Montreal, Canada

Great Lakes Steel is a Division of **NATIONAL STEEL CORPORATION**

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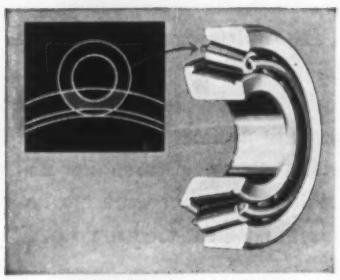

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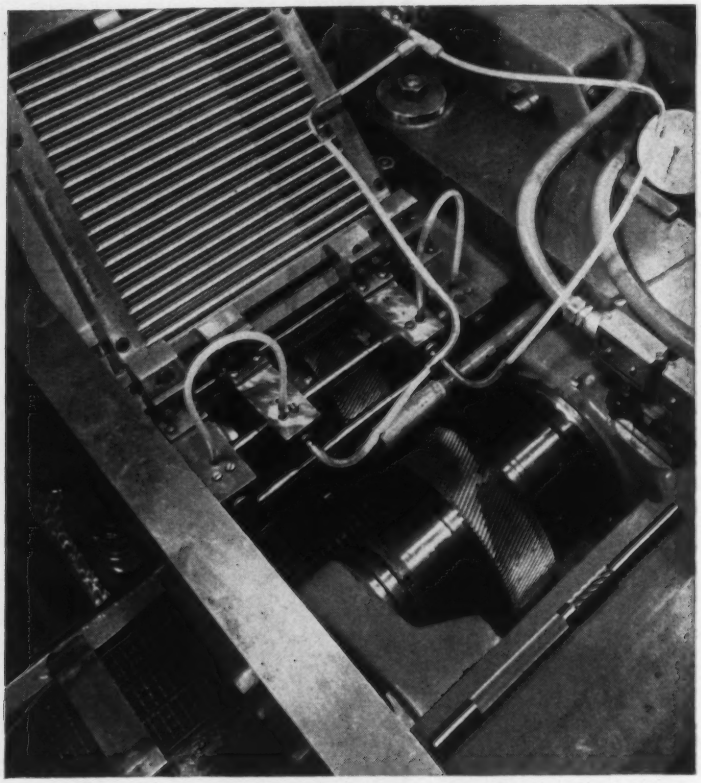

LANDIS

THREAD ROLLING MACHINES PROVE VERSATILITY AT CHRYSLER CORP.

Two LANHYROL Thread Rolling Machines have proven their worth rolling both the spline and knurl on starter motor armature shafts at the Chrysler Corporation Electrical Equipment Plant, Indianapolis, Indiana. Workpieces are automatically rolled by the infeed method with electropneumatic die cycling (see specifications and illustration).

Workpiece specifications:

Material	C1144 steel
Workpiece length	11"
Involute spline	.625 P.D., 21.1849/40 pitch, 12 tooth, 30° pressure angle, 25° right-hand helix angle, $1\frac{13}{16}$" long
Knurl	.633"-.638" diameter, .040" pitch, 49 tooth, 90° straight knurl, 3¾" long

The versatility of the LANHYROL leads to cost-saving benefits. For example: 1. One LANHYROL often can supplant two or more thread milling, hobbing or grinding machines and reduce handling, machine maintenance, and per piece cost in terms of floor space needed to produce the product. 2. Thread rolling generally requires less material than other threading methods. 3. Thread rolling can often result in sufficient work hardening to the workpiece to eliminate subsequent heat-treating.

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The world's largest manufacturer of THREADING EQUIPMENT

599

Metalworking Newsfront 6

NEAR-PEAK AUTO PRODUCTION is set to roll. There are prospects for an output of 1.8 million cars in October-December. This is just short of the record 1,949,000 turned out in 1955's last three months. The 1.8 million figure is strictly a projection based on labor peace and popularity of the 1962 models.

IS CONTINUOUSWELD PIPE on its way out in this country? A builder of mill equipment, Mannesmann-Meer, Inc., says electric weld mills, with stretch reducers, will soon be recognized as the answer to demands for speed and quality. Other builders and users see need for both electric and continuousweld.

STEEL FOUNDERS ARE OPTIMISTIC about last half year shipments. In a special survey of the Steel Founders' Society of America, 73 pct of respondents look for increased shipments. Consensus on the gain rate: 18 pct. Only 8 pct see a drop.

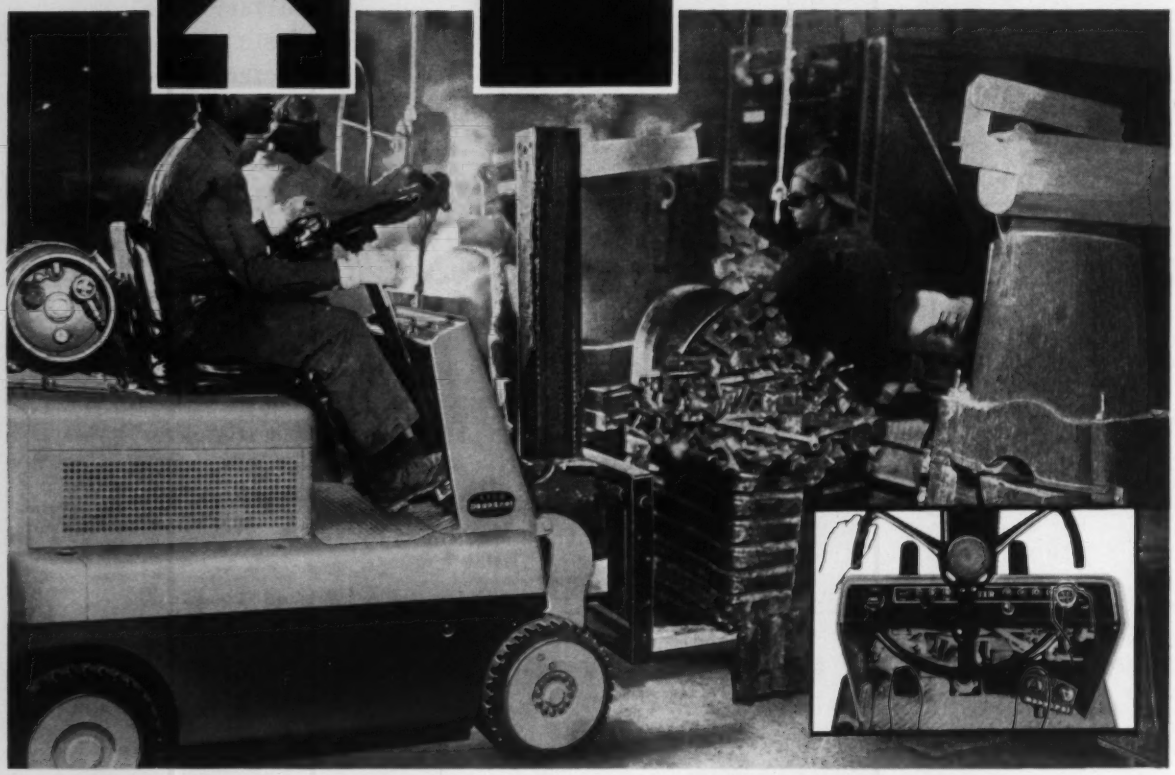
A PRICE CREEP IN INDUSTRIAL PRODUCTS is noted by many buyers in the September survey of the National Assn. of Purchasing Agents. Some 20 pct report finding higher price tags. In August, only 10 pct saw this trend. And 74 pct see stable prices in September compared to 83 pct in August. A small 6 pct find prices lower than the previous month.

WELDED CONSTRUCTION OF STEEL BUILDINGS is giving big impetus to the welding industry. This is one reason why A. F. Chouinard, director of research for Chemetron Corp's National Cylinder Gas Div., predicts welding will be a $2 billion industry by 1970. The $1 billion mark was hit in 1959.

A SOLID UPTURN IN EARTHMOVING EQUIPMENT SALES is noted by several producers. Sales have been on the road up for the past two months, they point out. These gains have been obscured by dour first half reports when business was slow. Reports on recent sales indicate a level 10 pct above the year-ago period.

LESS STEEL USE IN AUTOS is seen for 1962. One reason: Compacts' share of sales continue to rise. Ford is scheduling 50 pct of its fourth quarter production in compacts. Chevrolet compact production for the quarter is set at 50 pct of total Chevvy production of fourth quarter last year. One observer claims compacts take 30 pct less steel than standard-size cars.

HYSTER



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FRITZ WERNER AG'S ERDMANN: "More talk in New York about the problem than there is here in Berlin."

Report from West Berlin

W. Berlin Industry Stands Firm In Midst of Cold War Strife

W. Berliners have made a tremendous recovery since the end of World War II.

Now, they place confidence in West's determination to hold on.

But the East-West tug-of-war has its impact as industrialists try to maintain business as usual. By G. F. Sullivan

■ Just a dozen years ago West Berlin's heavy industry was digging itself out of bomb rubble. The Air Lift had shown that the West apparently intended to hold the city; that the U. S. would help rebuild it.

Today, some 600 men work in a shop (see cover) which company officials sometimes call "Taylor Hall." The reference is to President Kennedy's military advisor, General Maxwell Taylor. When the general was on duty in Berlin, he channeled $1 million in aid funds to rebuild and re-equip the shop.

Future Discussed — Tomorrow? Do West Berliners believe the West will stand fast on Berlin? Some are skeptical. "We say," said one, "that Mr. K uses the 'salami technique'; he takes over the world a slice at a time."

"I hope, but only time will tell,"

"Business as Usual"

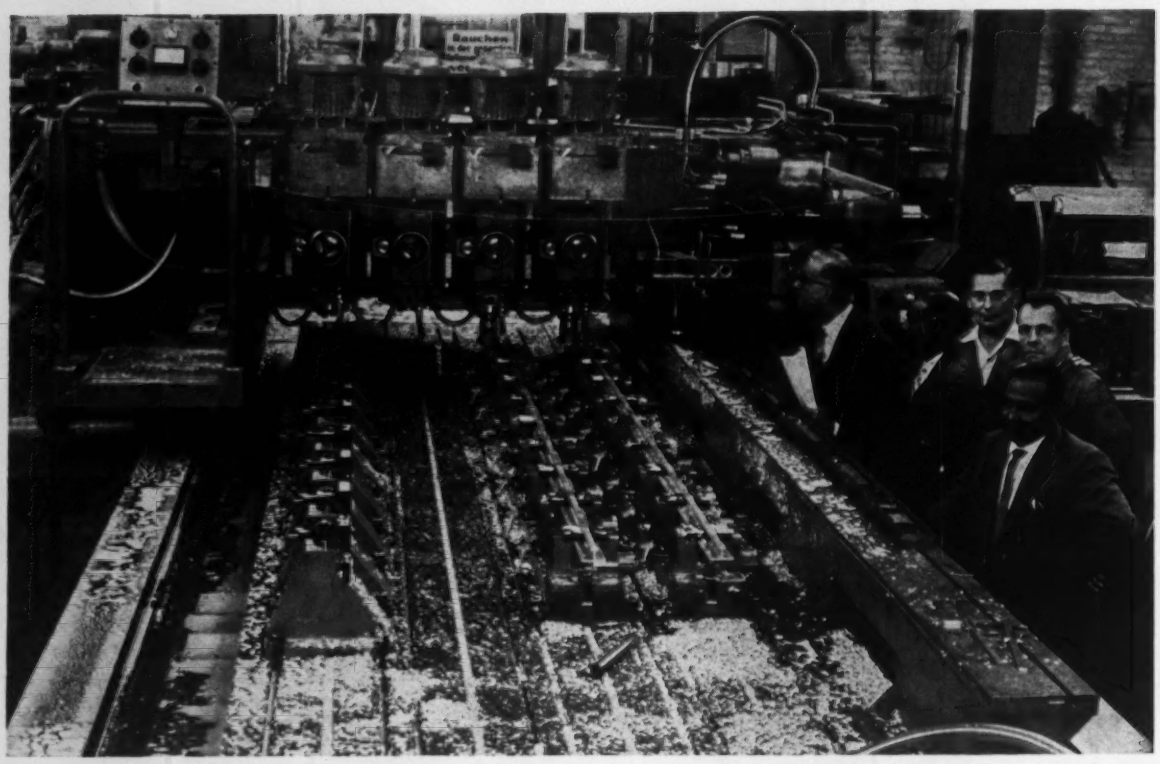
Those three words sum up the current attitude of West Berlin's industrialists. How long will it last? Just how is metalworking getting along in this outpost of free enterprise? How big is the industry, how do some of its executives feel about the future? This report brings you on-the-scene replies to these and other questions.

adds another in a machine tool plant which lost 300 men, or 10 pct of its force, when the cinderblock wall appeared on the eastern border the morning of August 14. At that time, some 60,000 East Berlin residents were cut off from their regular jobs in West Berlin.

Positive Thinking — Wolfgang Erdmann, special products manager for Fritz Werner AG, (machine tools) takes the other view. "The newspapers exaggerate this thing. It will pass like the other incidents."

"I am absolutely sure that the West will stand firm on Berlin—and not because of our blue eyes." This is the conviction of Rudolf Lubcke, a director and a top official of Borsig AG, West Berlin's largest (5600 employees) metalworking plant (see cover).

Because Berlin is the focal point of the West's struggle for survival,



RECRUITS: To solve labor shortage, W. Berlin manufacturers recruit workers from "developing" countries.

its industrial power is often overlooked. Yet, in terms of workers, West Berlin is West Germany's largest industrial city.

City at Work—Its electrical industry shipments were $600 million last year. AEG, in which General Electric has a 9 pct interest, has just opened a new skyscraper office building there. Next to it is the big new building of Osram, Germany's largest bulb manufacturer, in which International General Electric has a 29.4 pct interest. Nearly a fourth of giant Simens' 220,000 employees work in West Berlin.

IBM is putting the finishing touches on a 9-story computer center. National Cash Register's German division (80 pct owned by the Dayton Company) is there; so is Pitney-Bowes. National Twist Drill has a subsidiary in Berlin; so does Mine Safety Appliances. Otis Elevator has a half interest in Otis-Flohr. And there are others.

About a tenth of West Berlin's 2.2 million people work in its capital goods industries. Machinery, with 1960 sales of $210 million, is Berlin's fourth largest industry.

Effects of Border Closing—The visitor to West Berlin wonders how its industrialists have taken the border closing; how they've been affected by the loss of workers who lived in East Berlin. Are deliveries affected; orders being cancelled?

Borsig's Lubcke has the answer to the latter: "If we are unable to ship, you will not need the compressor" (diesel engine, boiler, electricweld tubing—or any of a dozen other Borsig products).

In most cases deliveries won't suffer much. Fritz Werner AG, which exports half its output, lost only 20 out of the 1800 in its West Berlin plant when the border was closed.

Many Hit—Berliner Maschinenbau, which has been quoting 12-month delivery on its program controlled miller, lost 10 pct of its workers. To close the gap: Overtime and newer machine tools.

Not all were as fortunate, notably the smaller firms. Willfred Kuntze of WEMA (the machinery association) says his group is now running a subcontracting clearing house and bottleneck-breaker. And those who are working seem to be working a little harder.

No Exodus—Yet—Will Berlin workers move to West Germany—where jobs are going begging? So far they haven't. Borsig lost only 9

NEXT WEEK

West German Steel

The West German steel industry has done a remarkable product development job. What it entails and the results obtained will be reported next week.

of its force of 5600 during the last two weeks of August.

But it could happen, Mr. Lubcke warns. And he's sure it will happen if East-West talks wind up without a concrete proposal holding some hope for eventual German reunification.

Before the wall went up, westward emigration from W. Berlin averaged 500 people a week. By mid-September it had climbed to 2000. While not a panic rate, it shows that younger people in particular are worried about their future in W. Berlin.

If there is no hope for a united Germany, many Berliners say they could not hold out forever; they fear a Communist take-over in time. If they see that coming, many will leave. In West Berlin, the best place in the world to compare the two systems, communism is detested.

East vs. West—When you try to compare two countries or systems, there is usually a margin for error or excuse because of differences in work habits, climate, resources, etc. But in Berlin both systems started on an equal footing after the war. East Berlin degenerated; West Berlin's capital goods sales last year were six times what they were in 1950. And it seems to thrive in the face of danger. Khrushchev's first ultimatum on Berlin was issued on November 27, 1958; next year the city's production index rose 11 pct.

Business as usual? Yes, at least until Western Berliners can see how the current crisis develops.

At Fritz Werner, for instance, an elaborate program for training "Students" from the "developing" countries continues in full force. Training, averaging 8 months per man, was limited to two students in 1952; last year there were 112, 32 from the Sudan. Item: Half of this company's exports go to the developing countries.

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LUBCKE: "The West will stand firm and not because of our blue eyes."

INSPECTION TOUR: Editor G. F. Sullivan looks over plans at Berlin plant of Fritz Werner AG. Designer Schweirtz, right, explains company's specialty—complete plants like this Burmese Army test laboratory.

Can Business Adjust to Congress

Probably, But the Administration Is Another Story

Laws passed in the first session of the 87th Congress don't have too much of a New Frontier look.

But the Administration is keeping the pressure on business through agencies and persuasion. By R. W. Crosby

REPORTING: Democratic Congressional leaders found an ally in the increased intensity of the Cold War in pushing through defense measures.*

■ Government action for 1961 cannot be judged on legislation alone. As far as businessmen are concerned, laws passed in the first session of the 87th Congress tell only half the story.

The other half of the tale still unfolds behind the walls of the White House and powerful regulatory agencies like the Justice Dept. Some prime examples:

While Congress kept clear of business control legislation, the President put his considerable executive pressure on the steel industry to hold the price line. His manner and timing in applying this pressure was that of a pro. In the end, this type of persuasion could be just as effective as legislation.

Though Congress passed no antitrust bills, trust-busting forces joined hands for an eventual assault. Not since Teddy Roosevelt's day have antitrust forces been so strong. The White House, the Justice Dept., the Federal Trade Commission, and congressional antimonopoly committee leaders now speak like one voice on antitrust matters.

Total Impact—Legislation is usually evaluated in terms of money or what new things it creates. But how is the impact of hearings, congressional pressure, executive persuasion or agency administrative action to be measured?

How much influence did the electrical manufacturing price-fixing hearings have? What will President Kennedy's warnings do to steel prices? What of Commerce Secretary Hodge's break with the Business Advisory Council; Labor Secretary Goldberg's strike mediation activities?

Not Warm to Business—The consensus is that the Kennedy Administration is anti-business. The President denies it. Irritated over this anti-business reputation, he is trying to win businessmen to his point of view. New Frontier officials down the line have been instructed to hold out the olive branch to business.

From the Administrative and persuasive end, the record isn't likely to please business. From the legislative end, the record of Congress wasn't too tough to take. But it has its good and bad points.

The Record—Some of the measures which Congress approved before adjourning last week aren't likely to warm up business support:

Minimum Wages—New coverage for several million workers in service and retail jobs, with spiraling effects on heavy industry. Wage floor to rise gradually from $1 to $1.25 an hour.

Social Security—New benefits for workers on social security rolls paid for in part by employers through higher payroll taxes.

Unemployment — Compensation benefits extended by raising taxes on employers.

Taxes—Korean War excise taxes and corporation tax rates extended for another year.

Plus Side—Some of the measures businessmen generally approve:

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*Front, House Speaker Sam Rayburn and Senate Majority leader Mike Mansfield. Rear: Rep. John McCormack, Rep. Carl Alpert, and Senator Hubert Humphrey.

Defense and Space—A record peacetime budget of $46.6 billion approved for more hardware purchases and overall military buildup. A record $1.7 billion for space exploration approved.

Housing—Existing Federal housing programs enlarged and new Federal subsidies and incentives okayed for slum clearance and urban renewal.

Public Works — A compromise $3.9 billion money bill approved for public works projects all over the country.

Exports — Government protection expanded to include civil as well as political risks for U. S. exporters through the export-import bank.

Some measures were approved which may taste sweet to one segment of business and sour to another among them:

Metals—Lead-zinc industry subsidies approved, but not as sweet as the depressed lead and zinc miners had hoped for.

Foreign Aid—A $3.9 billion compromise package passed authorizing a five-year program but requiring annual appropriations.

Highways—Truck and tire taxes increased to pump funds into the interstate highway system.

Depressed Areas—A new program of loans and grants established to rejuvenate areas of unemployment and poor production.

Regulatory Agencies — Federal Trade Commission revamp approved. The National Labor Relations Board and the Federal Communications Commission plans failed.

Some measures were shelved by Congress until next year:

Tax Revision — President Kennedy's tax credit plan for business investment held over.

Retraining for Unemployed—Subsidies for jobless workers training for new jobs held up in House.

Education — Construction and maintenance aid to schools shelved.

New Agency—Plans for a Dept. of Urban Affairs with cabinet status put off.

Some were conspicuous in their absence. Antitrust legislation is an example. Labor legislation was nonexistent in the enactment column, unless you include minimum wages. Long-promised depreciation reform never reached bill stage.

Investigations Coming — But, again, the legislative side was only half the battle. And it has been only half fought. The second session of the 87th Congress will convene in January with many pressing problems before it.

But investigations and pressures don't have to wait until January. Sen. Kefauver has already started antitrust hearings on anti-price fixing bills. Open hearings will soon be held on U. S. exports to Communist countries. The President will not let up on his drive to stabilize prices, particularly through pressure on the steel industry. Thus, no sooner does Congress adjourn than it begins creating programs and problems for next year.

As for the year gone by, general feeling is that the New Frontier started out in a rush and ended up at almost a standstill. The President got about anything he wanted to strengthen U. S. defenses. But the Berlin crisis did more to pass this than the Democratic majority. Anti-recession legislation passed through Congress quickly at first. But when the recession ended, so did the votes for liberal legislation.

Success or Failure? — Whether President Kennedy was a success or failure might depend on what political party you favor.

Democratic majority leader Mike Mansfield (Mont.) said the President's legislative achievement amounted to a "substantial investment in the security and progress of the United States."

Republican minority leader Everett Dirksen (Ill.), on the other hand, said the session was "long on quantity, short on quality and plenty rough on the taxpayer's pocketbook."

The Kennedy Administration's major failure: Putting down the conservative coalition. This coalition may be bigger and stronger by January, 1962.

CONGRESS: As the session of Congress drew out, the New Frontier became more difficult to reach and liberal legislation failed to move.

Why Aluminum Mills Cut Prices

Several Factors Lead to Mill and Product Reductions

Recent drops in primary aluminum and product prices are related to some extent.

But over-capacity and foreign competition are blamed for cut in prime metal; market conditions for slash in products.
By F. J. Starin

■ "Here's the heart of the whole situation," said the aluminum executive.

He was looking at a chart showing the gap between aluminum capacity and production. (See below.)

"As long as this gap exists the industry will continue having the problem it faces now," he added.

Alcoa's Action—The "problem" he referred to is the drop in prices of primary aluminum and a broad line of mill products, even in the face of a slightly firming market.

Aluminum Co., of America led both moves, cutting primary metal by 2 cents per pound early last week, and the broad, though unrelated list of products reduced by varying amounts by the end of the week.

An Alcoa spokesman indicates, unofficially, that the mill products probably would not have been cut were it not for the drop of primary prices. But beyond that the two moves are not as closely related as it would seem:

Promoted by Alcoa? — Alcoa cited foreign competition as the reason for its cut in primary metal. Observers generally agree that the prime cause was the offer of Aluminium Ltd., the large Canadian producer, to sell metal to customers at the Canadian price plus duty, freight, and handling from the border.

This, said one observer, would have put Canadian metal below the then U. S. price of 26 cents a pound in a belt of about 200 miles adjoining Canada. This includes a large group of aluminum customers.

Alcoa reported changes in mill prices do not conform to any uniform pattern. These were made, says the company, based on varying cost and competitive factors.

The company was apparently trying to be realistic in recognizing market conditions. What this probably means is that Alcoa is attempting to make book prices match actual prices at which the metal is being sold.

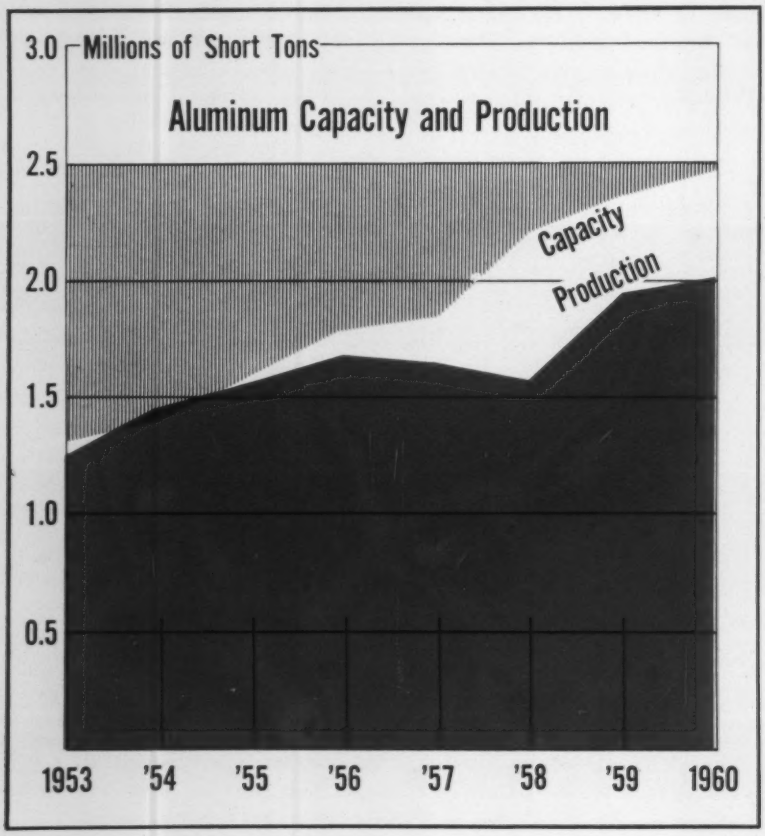
Reductions Listed — Trade sources say even though Alcoa was willing to meet competition on the discounted prices the company was losing some business because it insisted on proof before authorizing salesmen to offer below-book prices.

Some of the reductions in mill prices:

About three-fourths of sheet and plate products were cut an average of slightly less than 1¢ per pound. Actual cuts ran from fractions to 2 cents a pound. Can stock prices are unchanged.

Drawn pipe, tube, and tubular products now cost 2 cents a pound less for alloys 2014 and 2024. (For

Why Aluminum Prices Are Soft



example, 2024-T3, 1 in. pipe with .049 in. wall thickness now costs $1.68 a lb. It formerly cost $1.70.)

Some Alloys Cut — Extruded shapes, other than tubes, rod and bar, in alloys 2014, 2024, 7075, 7079, and 7178 were cut 2 cents a pound. Bigger volume soft extrusions, such as 6063, were not cut.

Some grades of alloy ingot were cut from .7 cents to .9 cents.

Electrical conductor was also cut. All-aluminum, and aluminum alloy are down ½¢ per lb, and ACSR is down ½ cent per lb of contained aluminum.

A competitor noted that Alcoa could not ignore the lower Canadian price. And this aluminum man was glad Alcoa maintained the delivered price, which he feels is a much easier and more equitable way to do business.

More Discounting?—On the drop in mill prices, one aluminum man commented, "Trying to put discount prices in the book is like running the wrong way on a moving stairway. You're right back where you started from."

This spokesman believes that unless markets firm up a lot more there will be further discounting off the new book prices.

Another aluminum man agrees, and says further that the Alcoa move may hurt rather than help the industry. He feels there will be a moratorium on the firming of markets that was beginning before the round of price moves.

This seller says a few factors had been stiffening resistance to discounting and, had the firming continued, the below-book prices would have disappeared before too much longer.

Market Is Key—Generally, the trade doesn't believe the smaller price tags will really take the steam out of improvements in markets from a tonnage standpoint. Some believe there may be some hesitation by buyers, but not for too long. They feel the condition of the markets of aluminum customers is the key factor.

Do Executives Share Blame for Labor Ills?

Retired GE labor executive blames management for many of industry's current labor ills.

He claims unions gained by default. But he offers program to restore negotiation balance.
By T. M. Rohan

■ Labor negotiations are getting worse, not better. And much of it is due to industrial relations men and their bosses not doing their homework. That's the view expressed by one old hand at the game, Lemuel R. Boulware, retired General Electric Co. vice president, at the 14th annual labor relations conference of Associated Industries in Cleveland.

He said unions came to power and business got a bad name "because of the failure of my generation to show the people what was really going on." And this must now be corrected, he said, by a five-point program.

Power of Unions — R. Conrad Cooper, U. S. Steel Corp. executive vice president of personnel services and chief labor negotiator for the steel industry, says he favors continuing meetings between labor and management rather than the tensions of the bargaining table, three-party meetings, or government commissions. He decried the massive power of labor unions and said it is small wonder the public is becoming skeptical of collective bargaining.

Other speakers indicated major new problems of labor relations groups are third party entry into negotiations. These include such as Kaiser Steel Study groups, foreign competition, automation, multi-plant seniority, and the general economic squeeze of "profitless prosperity."

Sins of the Past—In one of the most straight-forward talks heard at the conference in years, Mr. Boulware flayed the labor relations executives and their bosses for many sins of the past. But he offered a solid program for the future.

Because businessmen lack concern over their public image, he charged, most people think of them simply as "crooks" and their profits as "stolen money."

"Inept and Inactive"—In his generation, he adds, unions accumulated excess powers including a monopoly over production workers. Unions have also become the dominant factor in political opinion and feeling "because businessmen are politically too inept and inactive."

Balance of power is now with the unions, Mr. Boulware points out, because they have done all of their bargaining in the newspapers and with "political fireworks."

Five-Point Program — The five-point program offered by Mr. Boulware:

1. Labor men and their bosses must gain and spread knowledge of basic economics and business.

2. Give people a proper understanding of these so they may reach a decision on their feelings in the matter.

3. Employers should acquire an understanding of workers' aims and viewpoints in areas other than business, and be sincere about it.

4. Correct the "undeserved credibility" of union officials so workers and the public don't always look to them for the truth.

5. Avoid third party interference in negotiations. Generally, the third party will say "split the difference."

NEGOTIATORS: UAW negotiators at Ford, Bannon, left, and Prado meet with UAW president Reuther.

UAW Upsets Auto Timetable

Negotiations came at the wrong time for the auto industry.

Result is a mixed-up timetable of new car production. One result will be an all-out production race to get '62 models off to a fast start.

By A. E. Fleming

■ After settling with the United Auto Workers, General Motors Corp. assembly plants this week began to turn out cars fast and furiously to make up for a two-week production blackout.

But as GM factories hummed with activity, Ford Motor Co. and Chrysler Corp. were busy trying to get their bargaining business straightened out. They had to, to keep assembly lines moving and to keep GM from getting the jump in what is turning out to be one of most mixed up new model introduction seasons in history.

Can't Hold Back—Neither Ford nor Chrysler can afford to let GM get off and running in the 1962 derby which began with the first publicly introduced car of the season (Pontiac) on Sept. 20.

Local Problems—So both Ford and Chrysler are anxious to settle up with the UAW as quickly as possible. Late last week UAW president Walter Reuther imposed a strike deadline of 10 a.m., Tuesday (Oct. 3) on Ford. He emphasized the deadline applied only to the national economic and non-economic contract and did not involve local matters. Implication was that individual plants would keep on working while bargaining on local matters continued.

This was a departure of union strategy from that used against GM. But with 53 of its 85 bargaining units still miffed with unresolved local grievances, and with memories of the recent problems Mr. Reuther had with several of his local presidents still fresh in mind, Ford was still sitting on pins and needles.

The situation complicating a Ford-UAW settlement was not economics, since Ford offered to match GM's contract. Trouble concerned issues of outside contractors, maintenance of jobs, seniority, and production standards.

Contributing to Ford's uneasiness were happenings at its St. Louis assembly plant. A strike that began July 26 was still in effect there last week and has turned out to be the longest authorized strike in Ford history. Disputes concern production standards, health, and safety.

The St. Louis plant will affect Mercury output of 1962 models. The plant had been turning out Fords in the 1961 model year and is scheduled to switch to solely Mercury production this fall.

On Overtime—In addition, Ford assembly plants at Dearborn and Atlanta still are down for changeover to the new Fairlane series which goes into production in October.

Wanted: Productivity Formula

Alternate Steelmaking Methods Also Debated by AISE

Ways of measuring productivity were discussed at last week's meeting of the Assn. of Iron & Steel Engineers.

Engineers also studied the advantages and drawbacks of various methods of steelmaking. By G. J. McManus

■ Steel engineers debated ways to measure productivity last week in Pittsburgh. They also reviewed the merits of different methods of steelmaking and finishing. These questions were thrashed out at the annual meeting of the Association of Iron & Steel Engineers.

Although the steel operating managers tried to get a fix on their galloping technology, there seemed to be more questions than answers.

What's Productivity?—The whole concept of productivity needs to be reviewed, said W. T. Hogan, S. J., professor of Economics, Fordham University. A well-known authority on industrial subjects. Father Hogan said wage and investment studies should go beyond the question of output per manhour. He said efficiency gains can only be known if total input is related to total output.

The approach would include materials, capital and manhours as input factors. Capital would be the depreciation charge, but adjusted for inflation and obsolescence. Manhours would include the time of both management and labor; they would be weighted according to the skill and pay of the individual.

Input items could be stated as dollars and related to dollar sales. The result, said Father Hogan, would be something close to a profit and loss statement.

Savings But —- Operating men were told how new processes offered opportunities for big savings.

But they were also made aware of the opportunities for big mistakes as backers of alternative processes made their own cases.

Talks indicated how the scope and momentum of steel's technical surge have left a fluid basis for decisions. Current thinking on pipe mills will be proved wrong in a few months, warned one set of experts. Don't go overboard on basic oxygen vessels until you consider the impact of new openhearth practices, another group said.

Openhearth Analyzed—The need for precise economic measurement was underlined when AISE speakers wents into details on competing processes. The openhearth was discussed by E. B. Speer, administrative vice president, United States Steel Corp.

Mr. Speer described how U. S. Steel is injecting iron ore and limestone, along with oxygen, through openhearth roof lances. He sees heat times of 6 hours with this method. He predicts outputs of 100 tons an hour when all new instruments and auxiliaries are provided. He told how basic roofs have lasted over 1100 heats without oxygen usage and over 600 heats with oxygen.

Variety of Charge—These and other developments call for "an entirely new look" at the openhearth in relation to basic oxygen steelmaking, Mr. Speer said. The openhearth has proven its versatility in handling different types and amounts of hot metal. The scrap limitations of existing oxygen vessels must be considered in the matter of capital requirements.

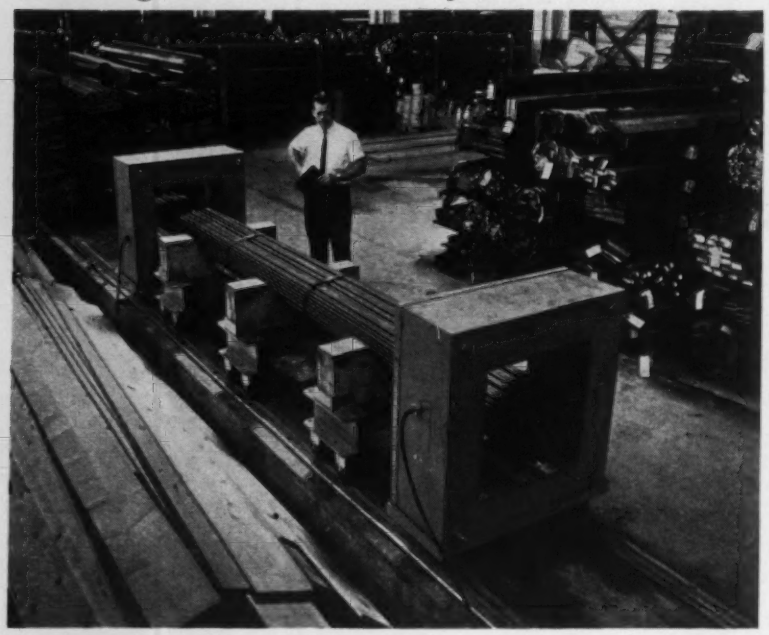
Pipemaking is also due for another look, said Mannesmann-Meer, Inc., Youngstown. According to Mannesmann, the continuousweld mill is on its way out.

Aetna-Standard Div., Blaw-Knox Co. replied with a staunch defense of the continuousweld mill for proper applications.

E. B. SPEER: Don't overlook the openhearth's versatility.

FATHER HOGAN: Make productivity measurement more exact.

De-Magnetizer Unit May Be Pioneer



BIGGER BARS: Cold drawn bar de-magnetizer at Bliss & Laughlin, Inc., Harvey, Ill., is rated biggest in the industry and may pioneer use of equipment of this size. It can de-magnetize up to 10,000-lb of cold drawn bar in 5- to 10-min. It was developed by Electro-Matic Products Co., Chicago, working with Bliss & Laughlin personnel.

Udylite May Become Metal & Thermit Div.

Directors of Metal & Thermit Corp., Rahway, N. J., and Udylite Corp., Detroit, have approved in principle a merger of the companies. Udylite would become a division of M & T.

The merger is seen as a move by M & T to strengthen its plating operations. The company is already highly diversified but wants to brace its standing in areas it is now operating in, such as plating.

Plating Strength — M & T is strong in chromium plating, a producer of inorganic metals and chemicals for the plastic, steel and welding industries. One-third of its $40 million sales are in detinning of tinplate scrap, in which tin and other useful chemicals are reclaimed.

Udylite is a major producer of nickel and cadmium plating. It manufactures a complete line of automatic plating machines, rectifiers and plating accessories. The company had net sales of $52 million in 1960 and its interest has centered in nickel plating, particularly automotive brightwork.

M & T's research facilities at Ferndale, Mich. will later be combined with Udylite's facilities at Warren, Mich.

Koppers Will Build Huge J&L Furnace

Koppers Co., Inc., Pittsburgh, will build one of the world's largest blast furnaces for Jones & Laughlin Steel Corp. Cleveland Works. When completed in 1963, it will give J & L sufficient hot metal supply to operate the new basic oxygen steelmaking furnaces at maximum utilization.

One innovation will be the use of high capacity burners fired in multiples in the blast furnace stoves. Avery C. Adams, board chairman, says, "This hitherto unrevealed J & L development will provide higher blast temperatures without the massive stove construction previously required."

Area's Biggest — The new furnace will be built near the other two blast furnaces at Cleveland. It will have a hearth volume of 28 ft and working volume of 50,000 cu ft, making it the largest in the Cleveland area.

The oxygen furnaces, largest in the U. S., will be able to produce 2.5 million tons of steel per year when operating at full capacity.

The new furnace is J & L's latest phase of a cost reduction program at the ingot level.

Armco Gets Into Fallout Shelters

Armco Steel Corp. is the first major steelmaker to enter the fallout shelter market on a national basis.

A subsidiary, Armco Drainage & Metal Products, Inc., will mass produce prefabricated units in more than 40 fabricating plants. It will also offer installation through a network of contractor-builders.

The shelter line ranges from a simple $400 basement unit to spacious underground shelters.

President Asked To Stockpile Iron Ore

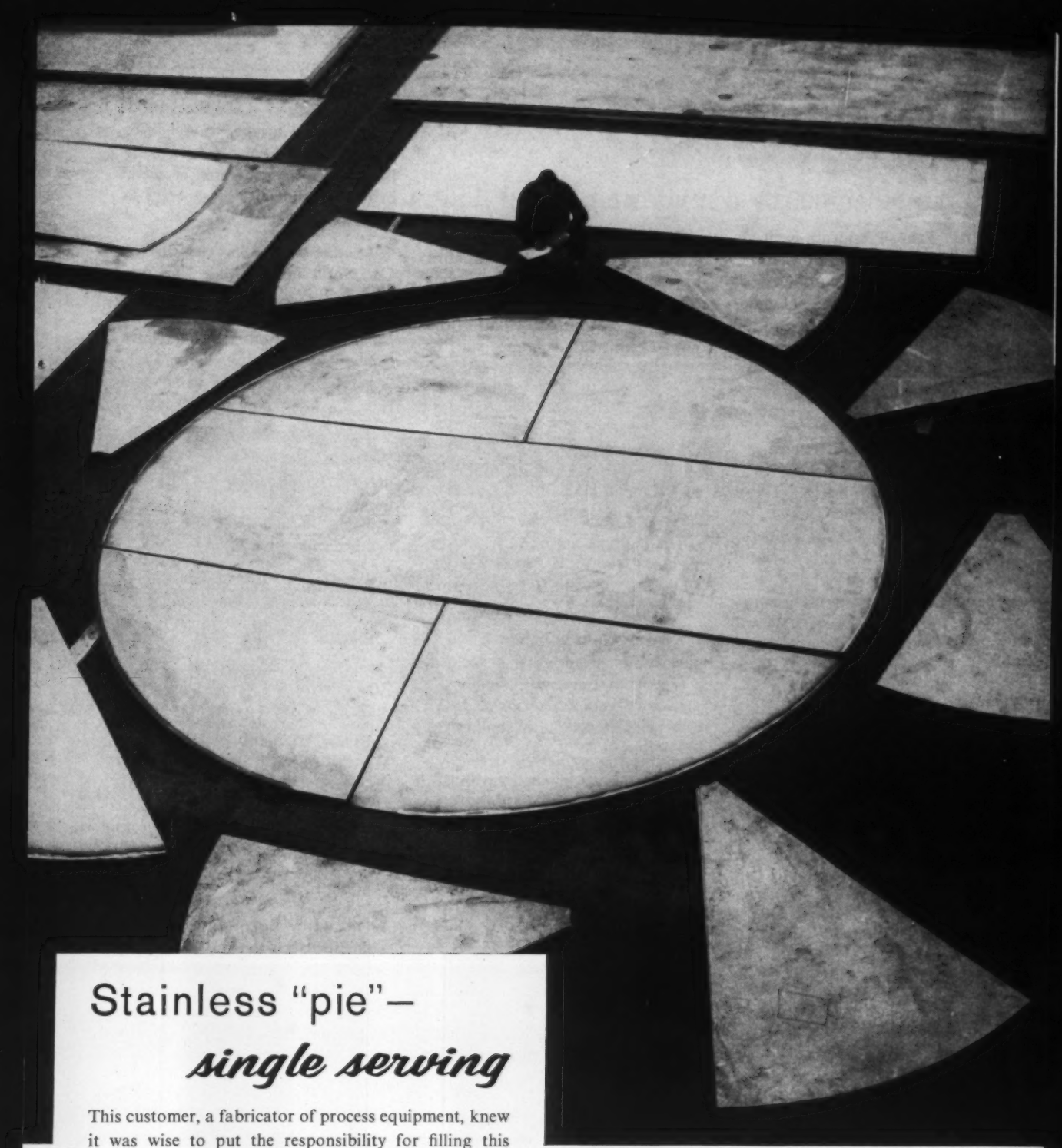
President Kennedy is considering a request to stockpile iron ore and impose quotas on iron ore imports.

The request came from Rep. John B. Bennett, R., Mich. The mining state representative wants the President to:

Stockpile iron ore as a stop-gap measure for the depressed mining industry.

Impose "reasonable" quotas on imports of iron ore as a long-term solution to the industry's problems.

Rep. Bennett told the President, "the evidence is overwhelming that the domestic iron ore industry is languishing and dying as a result of foreign imports."



Stainless "pie"—
single serving

This customer, a fabricator of process equipment, knew it was wise to put the responsibility for filling this stainless steel order in the hands of a single producer—G. O. Carlson, Inc. He knew that our specialists, working with modern equipment, would make each item of the order "to specification." And he also knew that our delivery promise is a trust that we fulfill.

For your order—or orders—of stainless steel plate and plate products, come to Carlson. Here skilled men, working with the finest equipment, are determined to match your every wish.

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District Sales Offices in Principal Cities

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • BARS AND SHEETS (No. 1 Finish)

INDUSTRIAL BRIEFS

First Fair—President Kennedy will open the first North Carolina Trade Fair at Charlotte, October 12. There will be exhibits of products and materials by over 500 North Carolina - based companies. Around 300,000 buyers and visitors from Free World markets are expected to attend.

Top Casters—W. E. Brown, executive vice president, Kiowa Corp., Marshalltown, Ia., was elected president of the American Die Casting Institute at the annual meeting in Chicago. W. G. Newton, Jr., president, Newton-New Haven Co., West Haven, Conn., was named vice president. The annual Doehler Award, highest honor of the industry, went to A. F. Bauer, manager, Doehler-Jarvis Div., National Lead Co.

Grand Awards — American Hot Dip Galvanizers Assn., in cooperation with American Zinc Institute, has presented the first two of 10 $1000 Galvanizers' International Awards. They went to E. H. Lenz, of Buffalo Forge Co., Buffalo, and R. D. Barer, consulting engineer, Victoria, B.C., Canada. Mr. Lenz was honored for his method of manufacturing housings, using a spot weld and sealer in assembly and prior to galvanizing to avoid distortion and warping from continuous seam welding. Mr. Barer devised the substitution of forged and galvanized steel clamps for scaffold construction, to retain steel strength and eliminate uncertainties of lighter metal performance.

Name Change — American Society for Testing Materials has changed its name to the American Society for Testing and Materials. ASTM President M. N. Clair said "The inclusion of the word 'and' in the Society's name adds emphasis to our research work in seeking knowledge of the nature of materials."

New Group — The American Assn. for Contamination Control has been formed for engineers concerned with the control of contamination. One of the early aims of the new Detroit-based group will be standards for taking dust counts.

Pump Entry — Integral Motor Pump Corp., Penndel, Pa., is now manufacturing canned pumps. The company has been in the corporate development stage for 2½ years.

Scrap Shift—Weiner Iron & Metal Co. has moved to a new location at 8200 E. Slauson Ave., Pico Rivera, Calif. The new yard occupies 10 acres.

New Name—Latronics Corp. is the new name of Shaw Instrument Corp. The company is building a two-story addition to its Latrobe, Pa. plant to handle expanded operations.

Fiber Buy—Diamond Alkali Co., Cleveland, has acquired through an exchange of stock Fiber Chemical Corp., Cliffwood, N. J. Fiber Chemical produces organic chemicals and inorganic specialties.

Broadened Line—Fairco Industries, Inc., Gardena, Calif., has acquired the Aircraft Bolt Co. Div. of Elastic Stop Nut Corp. of America. Fairco plants at Gardena and ABC's facilities at Monterey Park, Calif., will offer an integrated source of fastener supply for missile and aerospace industries.

Die Sale—Buell Die & Machine Co., Detroit, has sold the die division plant and equipment to E. & E. Miller, Inc., Lansing, Mich.

Bigger Markets—Redmond Co., Inc., Owosso, Mich., has expanded its marketing organization. The manufacturer of fractional horsepower motors and blowers is adding national sales representatives to the staff of factory sales engineers.

Metal Merger—Ceco Steel Products Corp., Chicago, is acquiring Mitchell Engineering Co., Columbus, Miss., manufacturer of metal buildings. Mitchell will operate as a division of Ceco.

Another Line—Sprague Electric Co., North Adams, Mass., has purchased all equipment of CBS Electronics used to manufacture electrochemical precision-etch transistors. Columbia Broadcasting System, Inc. dissolved its Electronics Div. at Lowell, Mass. and sold the plant to Raytheon Co.

Dallas Deal — Electro Consolidated Corp., Reading, Pa., has acquired Lighting Dynamics Inc. of Dallas. It doubles Electro's manufacturing facilities.

Two-in-One—Dynamic Electronics, Inc. has been formed to acquire other manufacturing companies in the electrical field. Already purchased are TKM Electric Corp., Rochester, and Drake Manufacturing Co., Friendship, N. Y.

Extra Division — Robbins & Myers, Inc. has formed a new Airtrol Div. at Springfield, O. It will specialize in design, production and marketing of unit type collectors to control dusts and mists.

First Coke—Granite City Steel Co. has "pushed" first coke from a battery of 61 new ovens at Granite City, Ill. It completes a major addition at the integrated steelmaking plant. The new battery will carbonize about 1525 tons of coal per day to produce 1000 tons of coke.

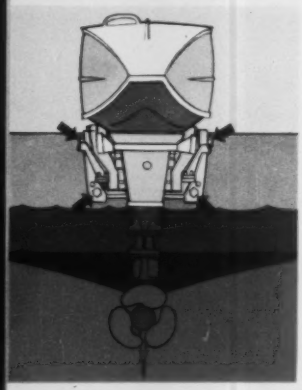
Pure Strip — Sherritt Gordon Mines Ltd., Toronto, is now offering for the first time pure cobalt coiled strip with good ductility. Supplied in production lots, it will have thicknesses ranging from 0.005-in. to 0.025-in., and widths of ¼-in. to 6-in.

Formal Opening—Sparton Corp., Jackson, Mich., opened its new military electronics facility of Sparton Southwest, Inc., this week at Paradise Hills Industrial Park, Albuquerque, N. M.

When a 1/2" aluminum bolt bears more than a 40,000-psi stress . . .

When a ½" aluminum bolt bears more than a 40,000-psi stress . . . . . .

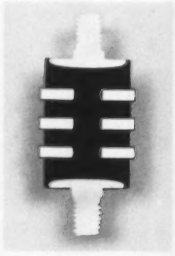
that's Alcoa Total Ability at work!



Hang a 210-lb outboard on the transom of a frisky speedboat, uncork its 75 horses worth of power and go zigzagging across a choppy sea. Given these circumstances, outboard designers tell us, tension on the engine mount bolts exceeds 40,000 psi.

As insurance that these bolts will never snap, Alcoa furnishes ½-in. x 4-in. hex-head aluminum cap screws that have a minimum tensile strength of 62,000 psi. That's enough reserve strength to stand up under unexpected impact or years of fatiguing use.

In screw machine parts as well as forgings, castings, extrusions and impacts, Alcoa can deliver aluminum in an almost limitless variety of forms, colors, textures, tempers and thicknesses.



Alcoa also produces tough, cold-headed parts like these for vibration-absorbing aircraft-type engine mounts.

Alcoa Total Ability, unmatched by any other light-metals manufacturer, can help you achieve an ingenious design solution, less waste in production or a product that sells better. How can we help you? Call your nearest Alcoa sales office, or write Aluminum Company of America, 855-K Alcoa Building, Pittsburgh 19, Pa.

ALCOA ALUMINUM
SCREW MACHINE PRODUCTS

TYPICAL COLD-HEADED AND SCREW MACHINE PARTS PRODUCED BY ALCOA

A. Tiny aluminum rivets and screw machine parts for a hearing aid. The paper clip indicates the diminutive size.

B. Alcoa produces and stocks the world's most complete line of standard fasteners.

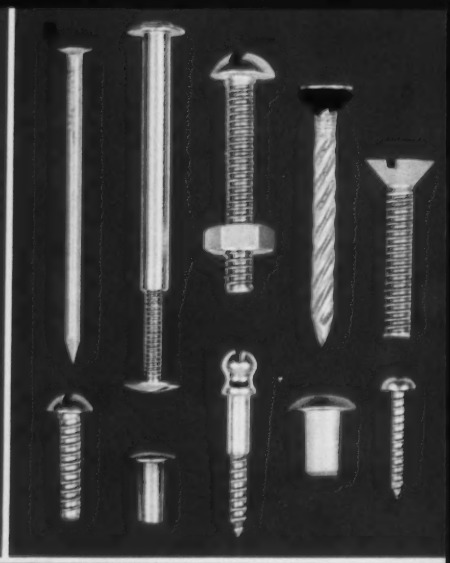
C. Precision screw machine part for military ordnance.

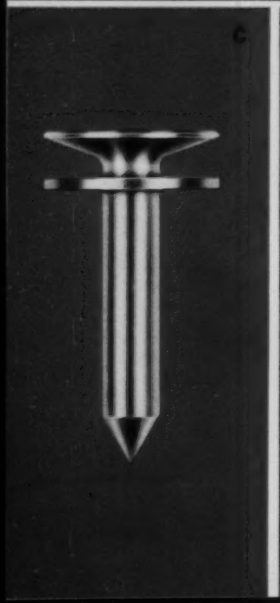
D. Pressure fitting machined from an Alcoa® Impact extruded machining blank.

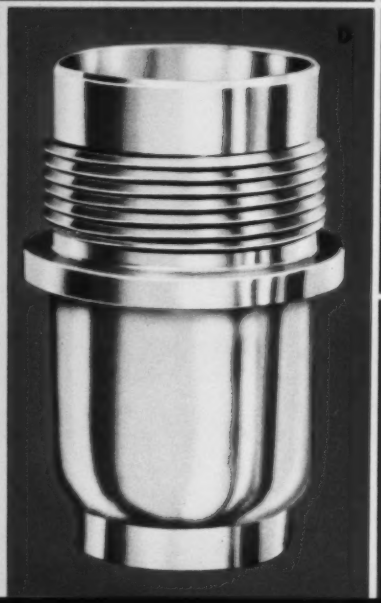
E. Cold-headed automotive distributor cap insert.

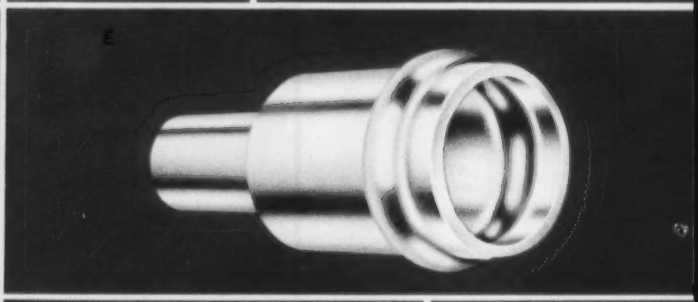
F. Piston for automotive air conditioner.

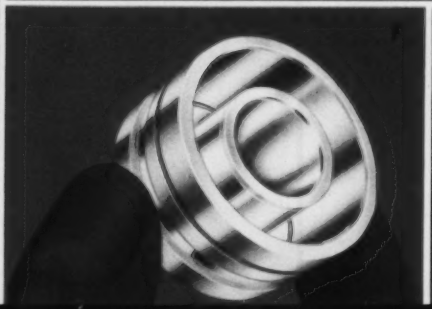
G. Knurled knob for a camera.

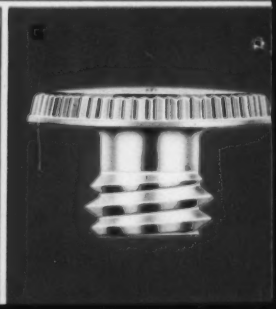












Business Borrowing Upturn Due

So far, total demand for business credit has done little to strain the money market.

Short-term borrowing has been sluggish thus far in '61, but increased demands for funds are likely from now on.

■ So far this year business has been cautious in its borrowing. But a stepup is in the making.

As the recovery picks up speed, demands for credit will increase. Industry will need more funds to rebuild inventories. In addition, some material may be bought against the prospect of price rises. The defense buildup will also have an effect on credit. All these factors will increase the demand for short-term funds.

Borrow and Repay—Until recently short-term borrowing has been sluggish. During the first half of '61, business loans declined about $500 million. But this doesn't mean industry was not active in the money market.

Long-term borrowing has been brisk. In fact, some of this capital funding has been used to pay off business bank loans.

It's true over-all demand for credit has improved since 1960. But, even so, when compared with the first half of 1958, (a similar business period) the advance is limited. During the first six months of '58, bank credit rose nearly three times as much as in the same period this year.

Consumers Cautious — Lack of business borrowing has not been the only reason for the credit slowdown. Consumers have also been cautious. While consumer credit rose $700 million this was $300 million less than in the same period last year. Recently, however, consumer credit has shown signs of strengthening. In another credit area—mortgages—demand has not been strong.

But borrowing by governments, state and local, totaled an estimated $4.4 billion in the first half, about $300 million greater than during the same span in '60. With the present military buildup more Federal borrowing is certain.

Interest Outlook—Against this background, what are the prospects for any changes in interest rates? Opinions at the start of the year that rates would be stable through '61 are proving true.

With the supply of loan funds plentiful, it will take a sharp upturn in demand to push rates up.

Some of the heavy long-term borrowing in the second quarter may be because borrowers don't expect rates to go any lower. But any drastic change in long-term rates appears unlikely.

European Managers Analyzed

■ How does the European manager differ from his American equal? Quite a lot, according to a recent study on the European Economic Community. It was prepared by fifteen U. S. businessmen under sponsorship of the Michigan Business Executives Research Conference, the Committee for Economic Development, and the Fund for Adult Education.

In a section on European management philosophy and methods, W. E. Bandemer, vice president, administration, King - Seeley Corp., makes these comments:

Planning: "The management team, found so frequently in American companies is almost non-existent in Europe. With comprehensive planning absent, control is little developed except in research. The controller has no real counterpart in a European company."

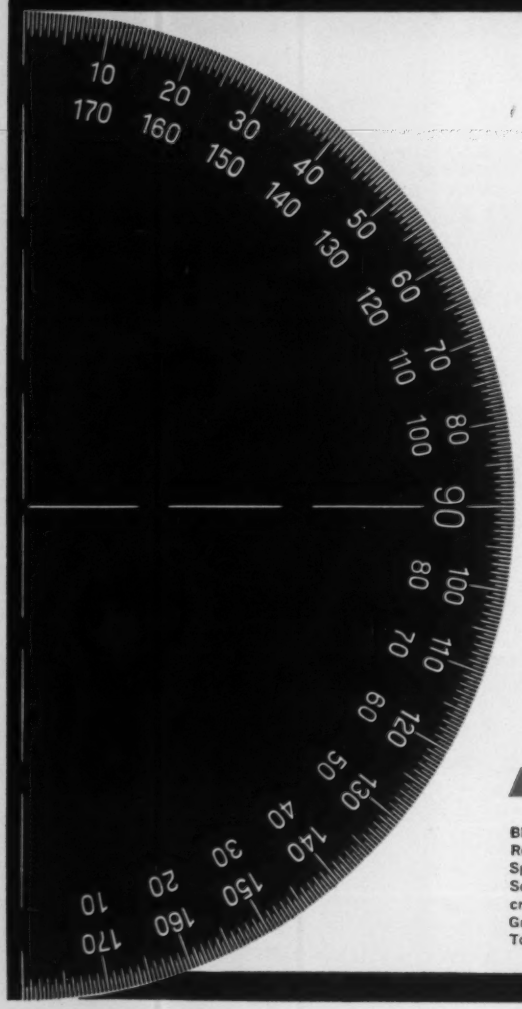
"Although European management realizes that planning is essential for a successful enterprise, comprehensive, plans are seldom found. . . . Middle management and foremen seem to have a psychological opposition to any kind of planning."

Organization and Training: "Far less attention is paid to organization structure and relationships than in an American company, and staff organization may be completely disregarded. . . . In many enterprises there is no systematic training of any employees, reliance at the labor level being placed on the traditional apprentice system."

Outlook: . . ."There is a strong tendency to look to the past for guidance in making decisions and to regard new ideas and concepts with suspicion.

"However, the European manager is a realist; and above all he has a high level of social ethics."

"to help an industry engineer and develop new products and new techniques for the benefit of users is part of our responsibility as a supplier of equipment"



The basic metals industry, like most industries, is always in a stage of development. New ideas and new products must be developed to stay ahead or even abreast. This means hard work, man-hours, and money.

If a supplier is to remain a first source supplier to the industry he serves, he must also be willing and able to supply some of his own man-hours, hard work, and money for the good of the industry from which he derives his business.

We have many projects in our confines at this time on flat rolled, pipe and tube, and cold draw. We are spending our own time, effort, and money to help bring the new ideas and the new products to the surface.

Why shouldn't we? The steel industry and the non-ferrous industry have been good to us in our many years in business.

300 Sixth Ave., Pittsburgh 22, Pennsylvania

Aetna-Standard Division

BLAW-KNOX

BLAW-KNOX

Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes Towers and Special Structures • POWER: Power Plant Specialties and Valves

How Ford Sees Materials Trends

How Metals Shape up for Fords of the Future

Materials specialist outlines aluminum vs. cast iron engines as seen by Ford Motor Co.

And here's a rundown of other materials. Changes aren't extensive, but trends are significant. By A. E. Fleming

■ The only Big Three holdout on aluminum engines is Ford. And a visit to Dearborn indicates it'll be some time before an aluminum engine goes into a Ford, Mercury or Lincoln.

This is J. R. Forrester, supervisor of Ford's material development section speaking: "We've experimented with aluminum for some time, but we haven't changed our way of thinking on aluminum blocks even though other companies use them."

What's in a Name—One reason General Motors, Chrysler Corp. and American Motors took to aluminum, according to the Ford official, was an idea that customers might be attracted by the aluminum name. "But it's been demonstrated in the past year or two that people don't care what the engine is made of as long as it runs well," he says.

It's been reasoned that Ford's introduction of a thin-wall cast iron V-8 this year may affect aluminum thinking. Mr. Forrester is one who reasons this way. "If we can make the cast iron engine light and economical it might stall the advance of aluminum somewhat," he claims.

Insofar as the materials picture goes for 1962 FMC cars compared to 1961's, Mr. Forrester cites "no extensive changes."

His comments on various materials:

Steel—"There's no switch in where it's used, but there is in the amount used because on the average cars are smaller this year. Our Fairlane, for example, requires less steel than last year because its size has shrunk."

Stainless Steel — "Automakers put pressure on steelmakers to improve the quality of 430 grades. They've improved, but we're still not entirely satisfied. If they improve more, we'd be inclined to use more stainless rather than look for substitutes. However, stainless prices came down recently and it's a fact that when you improve your product without raising prices, you enhance the possibility of its use."

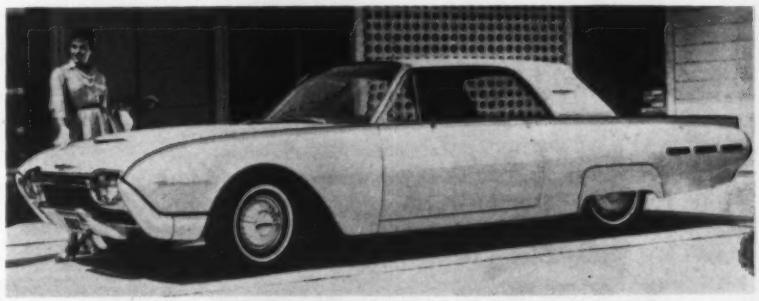
Magnesium — "We always keep an eye on this material. The deterring factor is that possible improvements in parts still don't offset high costs. We're looking into many areas of the car for potential magnesium uses, though. The engine probably shows the best possibilities."

Zinc—"We're using as much or more galvanized steel than in 1961. But the limit has pretty nearly been reached for the time being. There's no need to use galvanized on components where there's no corrosion problem, and our critical parts now use the coated metal. We used galvanized on rocker panels in 1961. Others are doing the same this year. There's always the possibility of using galvanized fenders, but the higher up the car you go the more critical paint appearance gets and this might pose a problem."

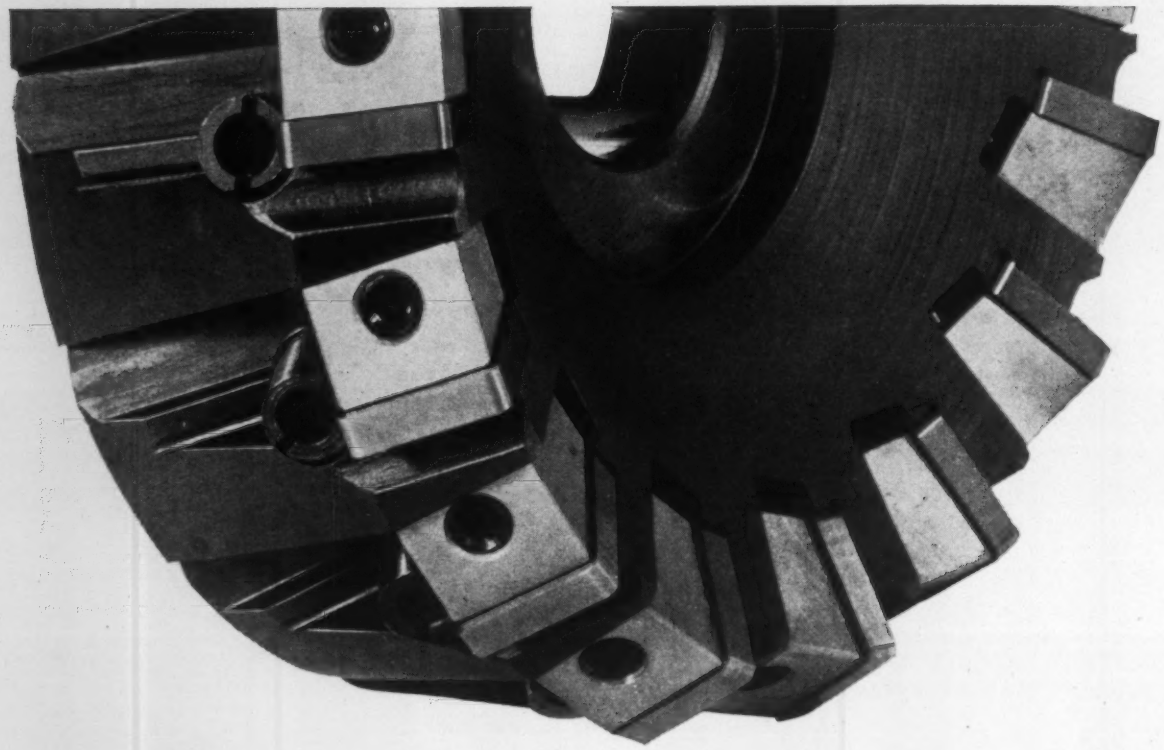
Copper and Brass—"This should hold its own. Aluminum radiators have been investigated, but I think even if aluminum prices could match copper and brass we'd retain the latter."

Plastic—"We're continuing about the same applications as 1961. A couple changes are potentially close, such as a plastic accelerator pedal and radiator tank, but they aren't in production yet. There's a trend toward plastic fasteners which reduce corrosion in exterior molding areas and don't scratch the body when you put them on as metal ones do."

T-Bird Gives Birth to Five More Models



THUNDERBIRD: Few changes outside, but 100 engineering improvements are claimed for 1962. Line has been expanded to five models, also.



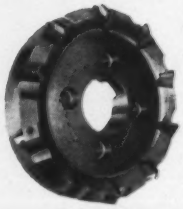
Here's the new, broader line of

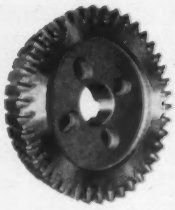
V-R MILLING CUTTERS

V-R Throw-Away Insert Milling Cutters bring the economies of "throw-aways" to your milling operations — provide lowest cost per edge for all roughing, semi-finishing and finishing cuts on light, medium and heavy duty cast iron, steel and nonferrous metals.

V-R "Rigidcut" Milling Cutters, with inserted blades, are available in two basic cone-type designs — fine pitch for high speed, fast feed milling and coarse pitch for light or medium feed and speed combinations.

V-R "Varicut" Milling Cutters, with inserted blades, give you 4-way interchangeability for plain milling, full side milling, half side milling and staggered tooth milling.





Many exclusive V-R Milling Cutter features combine for outstanding production ability. V-R throw-away inserts and inserted blades are available in a wide choice of quality carbide grades. Catalogs 6103 and 6104 show the complete, new V-R Milling Cutter line. Ask your V-R man or write for your copies today.

VASCOLOY-RAMET CORPORATION
802 Market Street, Waukegan, Illinois

V-R FIRST CHOICE of more and more plants

FM-866

Manganese Metal Market Grows

New $5 Million Production Plant to Go on Stream in '62

Demand for manganese metal may grow at the rate of 12-pct-per-year for the next decade.

American Potash & Chemical Corp. is building a plant to cash in on this growing market.
By R. R. Kay

▪ "We'll capture 25 pct of the manganese metal market within a reasonable time." So says Peter Colefax. He's chairman and president, American Potash & Chemical Corp., Los Angles.

"How?" The IRON AGE asked, in an exclusive interview.

"We're building a $5 million manufacturing plant at Aberdeen, Miss. By early next year it will go on stream. We'll be able to turn out 5000 tons per year."

From A to Z—"We're not exactly strangers in this field," Mr. Colefax pointed out. "This new project simply broadens our position in manganese chemicals. We have a large plant for making electrolytic manganese dioxide at Henderson, Nev. The new plant will be our first commercial manganese metal operation."

"We've researched the field from A to Z. The steel industry's use of the metal is constantly increasing—and at a pretty good rate. It's our belief that there's room for another producer in the field. We feel so strongly about it that we're backing it up with a $5 million investment," Mr. Colefax said.

Growing Market — During the past ten years, there's been a healthy rise in the use of electrolytic manganese metal in steelmaking. Last year, the industry consumed 15,000 tons.

American Potash's W. J. F. Francis looks for more and more use of the metal. He's vice-president-marketing. "A 12-pct-per-year jump during the next ten years is in the cards. And it could go even higher in the mid '60's," he said.

Mr. Francis says that the specifications of his company's products will be the highest in the industry. He expects to start deliveries early in the first '62 quarter.

Experienced Staff—Another plus Mr. Francis claims is his staff—all with long experience in selling to the steel industry.

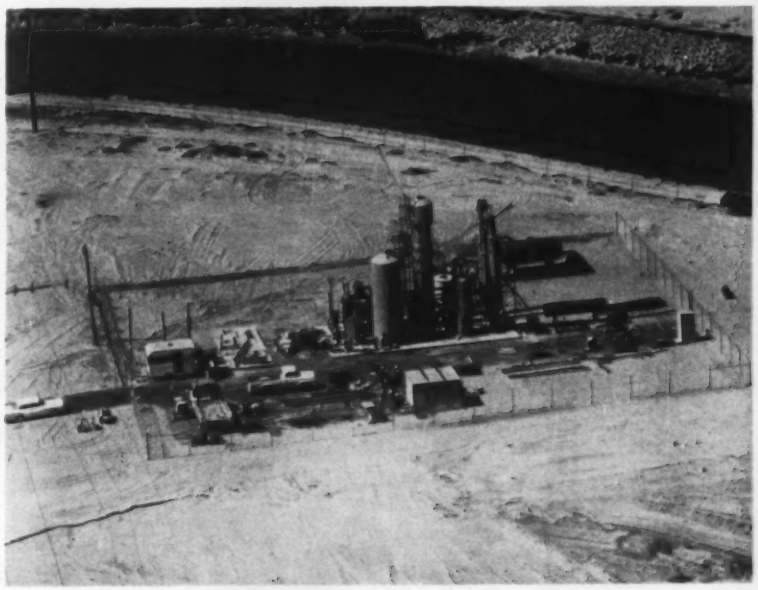
"With such rosy growth prospects, I'm confident we'll make our sales goal—$3.5 million per year. We're so optimistic that we're already planning to expand our Aberdeen facility within a couple of years," Mr. Colefax said.

Right now, the company has no plans to sell abroad. But Mr. Francis said that if it can, it will.

Foreign Exchange—To keep all the bases covered, the company just entered into a manganese metal technical exchange agreement with a new French company, Les Metaux purs Pechiney-Outreau M.P.O.

Peciney-Outreau is owned equally by Pechiney, a leading French chemical company and Les Acieries de Paris et d'Outreau, largest ferro-manganese metal company in Europe. The combine was formed to produce electrolyte manganese.

Test Sea Water Conversion Plant

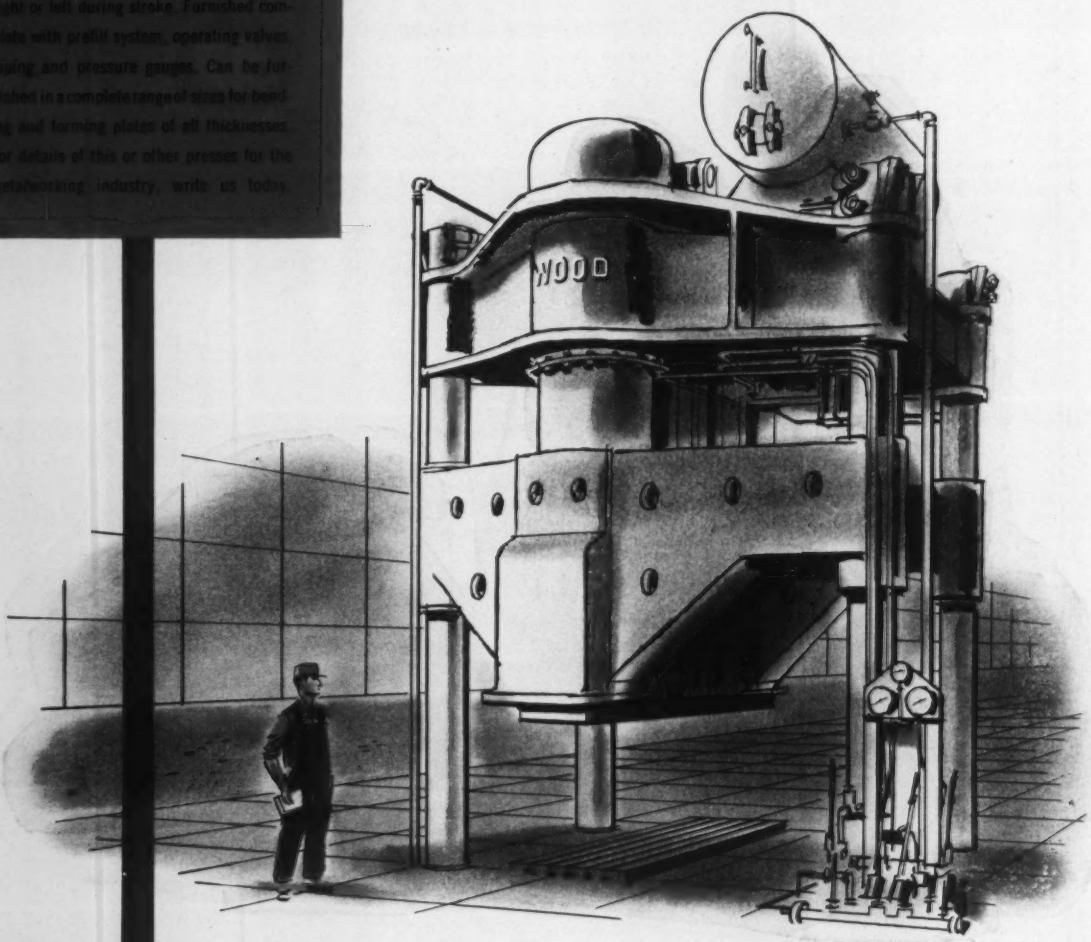


SEA FREEZE: Rocketdyne's sea water conversion pilot plant went into check-out operation near Oxnard, Calif. last week. It uses a new freezing process for converting sea water to fresh water.

1500-ton Heavy-Duty Forming Press for bending and forming operations on heavy steel plate. Moving plates can be tilted right or left during stroke. Furnished complete with prefill system, operating valves, piping and pressure gauges. Can be furnished in a complete range of sizes for bending and forming plates of all thicknesses. For details of this or other presses for the metalworking industry, write us today.

You'll like what it does to production

It's just plain common sense—when your down-time decreases your production is bound to increase. Down-time can't be eliminated, but R. D. Wood Presses hold it to a minimum. The sound design, choice materials and careful craftsmanship that go into a Wood Press produce a superior product—a dependable, smooth-working press that can't help but increase production records. Write for our catalog and engineering information—no obligation.



R. D. WOOD COMPANY
FLORENCE, NEW JERSEY

Upturn Slow to Show in Orders

But Tool Industry Says Prospects Are Good

Machine tool orders in August were only slightly above the recession level of 1960.

But manufacturers are certain that orders are going to improve in the months ahead.
By R. H. Eshelman

■ Machine tool industry marked time during August. That's the meaning of the figures released by the National Machine Tool Builders Assn.

Net new orders for the month in cutting type machines came to $45,950,000, bringing the running total for eight months of the year to $357,850,000. This is just 6 pct more than the like period of 1960.

Sales of presses rode along slightly above July. Considering that 1960 was a recession year, it appears that the widely heralded recovery has not moved down the road very far, yet. At least it hasn't hit machinery markets.

Outlook Is Good—However, there are great expectations in virtually all capital goods areas of a steady rise in business soon.

As one machine tool president puts it: "We're certain there's a surge in orders ahead sooner or later; metalworking plants just can't keep going much longer with those old and obsolete tools they have now. They have to wear out some time."

Besides substantial foreign business, one encouraging sign has been that orders have come from what one spokesman calls "Tom, Dick and Harry." Namely virtually all segments of metalworking. Some builders have done much better in August and into September than last year. One area that's far below normal is the automotive.

No Big Projects—A Detroit tooling source remarked recently: "I don't know how auto brass is planning to build seven million cars this year. They haven't even ordered enough cutting tools yet to really get started."

In the past few years there have been no really big domestic tooling projects such as brought prosperity to special machine builders in the fifties.

Rebuilt Lines—General Motors Corp. has completed rebuilding some transfer units for its modified engine lineup. One of the more interesting jobs is said to be machining setup for the Buick V-6; another is the Chevy four-cylinder transfer unit.

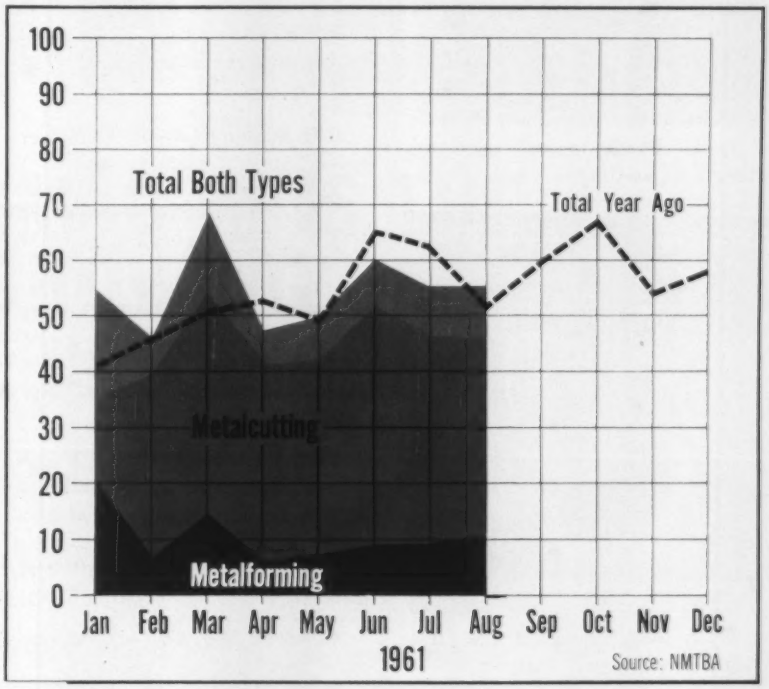
There is talk around Detroit about some big programs ahead in complete retooling for the '63 models. So far it's mostly rumor. Few inquiries have appeared.

Foreign Jobs—In the special machinery plants today the foreign jobs—such as the big General Motors Australian program—are supplying the bread and butter.

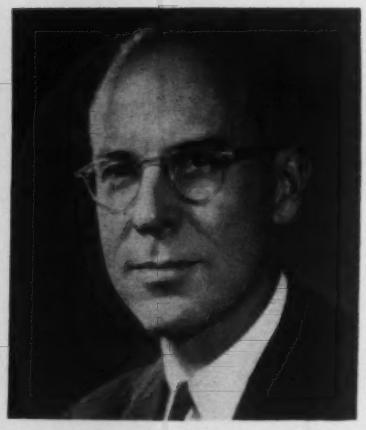
Why the current machine tool sales hesitation then? Many industry spokesmen think it's due to the auto labor negotiations. The GM strike prevents moving ahead.

MACHINE TOOLS–NET NEW ORDERS

In Millions of Dollars — Metal Cutting and Forming Types



MEN IN METALWORKING



Robert S. Ingersoll, elected chairman of the board and chief executive officer, Borg-Warner Corp.

L. G. Porter, named president, Borg-Warner Corp.

W. J. Kerr, appointed vice president, development, Yoder Co.

Towmotor Corp.—Galen Miller, elected president; R. L. Fairbank, named executive vice president; C. E. Smith, named chairman of the executive committee of the board of directors.

Joy Manufacturing Co.—J. W. Thornton, elected vice president and general manager, Industrial Div.

Eastern Stainless Steel Corp.—W. T. Swomley, appointed vice president, finance.

Detrex Chemical Industries, Inc.—Leroy Camel, elected vice president.

Yoder Co. — C. J. Lantz, appointed director, production.

Amsler Morton Co. — E. L. Hradesky, named asst. to the president.

Metal & Thermit Corp.—R. A. Bernabo, named corporate secretary; E. J. Robesch, appointed asst. controller and asst. secretary.

E. W. Bliss Co.—Paul Jones, appointed general manager, Hastings Div.

Erie Foundry Co.—J. E. Wilson, named general sales manager.

Ohio Knife Co.—Jim Gillis, appointed general manager, operations, Mill Sales.

Baldwin - Lima - Hamilton Corp.—R. J. Buckley, appointed asst. general manager, and R. H. Marshall, named head, financial dept., Standard Steel Div.

Borg-Warner Corp. — F. A. Flower, appointed manager, Washington, D. C., office; J. R. Mueller, appointed managing director, Morse Chain Div., Borg-Warner Ltd.

Capewell Mfg. Co.—David Lowman, appointed sales engineer.

D. I. Brown, appointed president, Seaway Steel Div., Roblin-Seaway Industries, Inc.

Goodyear Aircraft Corp.—D. P. Barlow, appointed manager, value analysis dept.

Dravo Corp.—H. K. Hicks, appointed manager, Philadelphia district office, machinery sales dept.

Minneapolis - Honeywell Regulator Co.—R. T. Waits, Jr., appointed eastern regional industrial manager.

Link-Belt Co.—H. M. Horton, appointed sales manager, Philadelphia plant; A. B. Schachte, Jr., named asst. sales manager; J. J. Bradley, named district manager, Summit, N. J.

Eaton Manufacturing Co.—R. W. Firlik, named manager, economic research, and J. A. Kinley, appointed manager, product promotion, Marketing Dept.

L. W. Mawhinney, named vice president, Metal & Thermit Corp.

HERE'S WHY...

POTOMAC® M IS THE FASTEST GROWING DIE STEEL IN THE DIE CASTING INDUSTRY

- ***Product Quality***—the characteristics and properties you require in a die block . . . the machinability, stability, response to heat treatment . . . the *right* grade for your job.
- ***Facilities***—unmatched, by anyone, anywhere . . . production equipment specifically designed for the job at hand.
- ***Availability***—stock on the shelf, finished and ready for you . . . and job-shop delivery schedules, the industry's most dependable.

3702-1

PRODUCT QUALITY through...

Die quality clear to the center . . . upset forging quality . . . and in pressed billet stock! That's what puts Potomac M . . . A-L's H-13 Die Steel . . . in a class by itself. And *that's* the kind of quality that's absolutely mandatory for the intricate interior patterns in today's complex diecasting dies.

Quality like this has been associated with Allegheny Ludlum Die Steels over the past 20 years, during a period when die blocks were generally running less than 1200 pounds. Holding rigid specifications on ultrasonic soundness, grain size, and response to heat treatment in blocks of this size was one thing. Offering consistently higher quality in much larger die blocks . . . more and more the rule these days . . . is something else again.

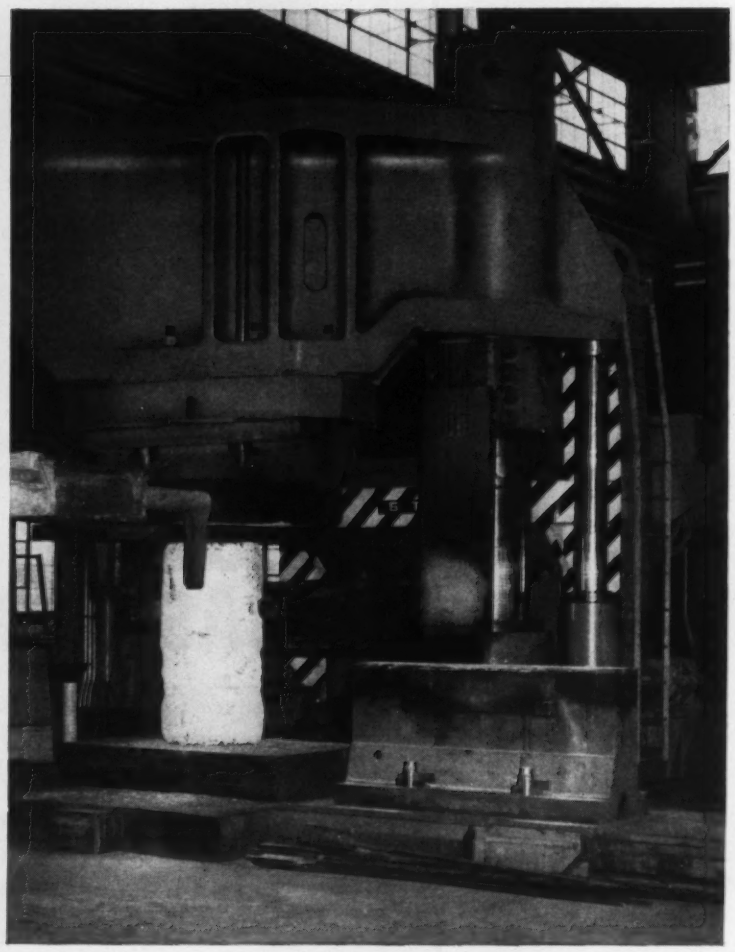
But, Allegheny Ludlum has become *the* specialist in doing just that . . . in providing these massive chunks of steel with the same center quality, machinability, and mechanical properties generally associated with much smaller sections.

And here's what it means to you

It means that Potomac M dies have greater strength in the transverse direction, and combine the ultimate in toughness with machinability and size stability. It means water cooling channels may be employed without the risk of cracking your dies due to thermal shock. It means better resistance to abrasion and softening at elevated temperatures . . . and, greater resistance to wash and heat checking. Most important, it means Potomac M is specifically created, and specifically processed for you . . . the most practical and useful material for your diecasting needs.

...A-L's 2,000 Ton Forging Press

Production equipment specially designed for the job at hand is part of the story. The direct pumping facility and fast, closely controlled action of A-L's unique forging equipment permits greater reductions in area from ingot to billet in a single heating, and results in complete ingot reduction in a relatively short time, with fewer reheats necessary. Coupled with A-L's ability to produce ingots up to 40″, of superior quality as-cast, the capacity of this press to rapidly and *completely* work such ingot grain structure inevitably results in an exceptionally high center quality in the billet, together with a refined grain structure more responsive to heat treatment. Substantially improved mechanical properties are obtained in the forged die blocks, with particular improvement in transverse tensile strength and ductility.



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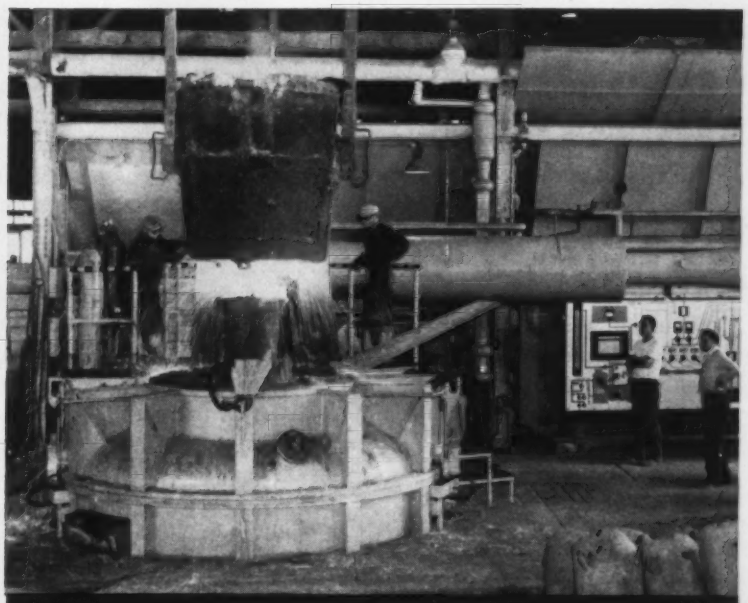
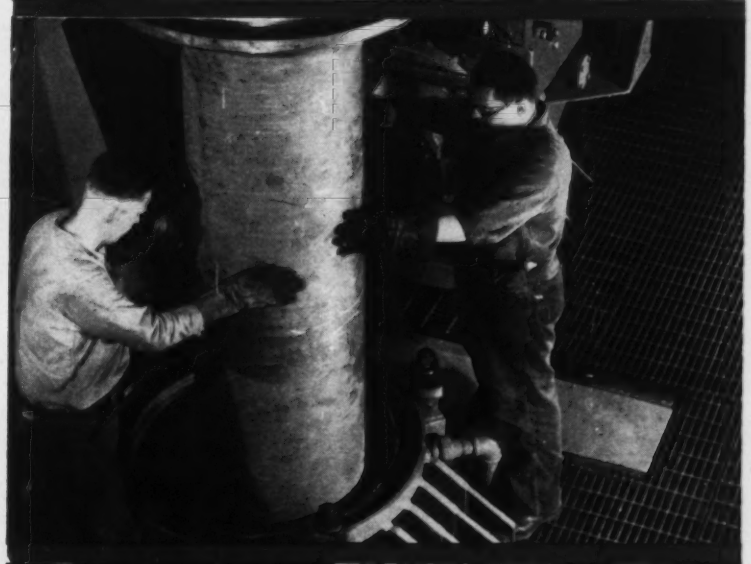
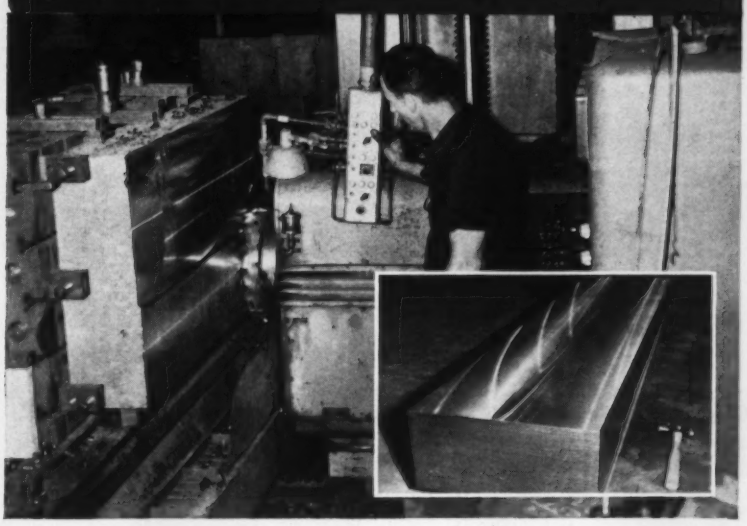






...A-L's Vacuum Degassing

Potomac M Die Steel is vacuum degassed . . . as a matter of routine. Vacuum degassing results in a cleaner steel, without blemishes or subsurface discontinuities . . . those imperfections which often reveal themselves in the die only after considerable machining has been done. Vacuum degassing produces a steel with lower oxygen and hydrogen content, with greatly reduced tendency toward microcrack formation, with fewer nonmetallic inclusions . . . a steel with better, more reliable mechanical properties clear through.

...A-L's Special Melting

For the unusual die applications requiring the ultimate in cleanliness and center quality, Allegheny Ludlum now offers its Consutrode® Potomac M. For requirements involving a super-finish die, the superior cleanliness of this vacuum melted product assures the die maker of an unblemished working surface clear through the workpiece. Equally important, this vacuum melted steel provides an improved transverse ductility in large die blocks, particularly applicable to dies which require the ultimate in toughness and resistance to thermal shock.

...A-L's Machined Finish

All bars and blocks in the larger sizes are milled to a finish that permits die layout right on the steel we ship. Finished closer to final size, there's much less wasted metal to wind up as chips on the floor of your shop. Allegheny Ludlum Potomac M die blocks are delivered to you free from scale and decarburized surface areas, and ready for your diemakers.

3702-3

AVAILABILITY

Allegheny Ludlum's Potomac M is part of the Steelector Program, a unique system which enables tool steel buyers to select the proper steel on the basis of intended application, and check on the availability of the desired size and shape before any purchase decision is made or any paperwork issued. Individual Data Stock Lists for each Steelector Grade clearly set forth the size and shapes of bars and billets available from stock . . . sizes which will serve the requirements of all users. This is all finished stock . . . over 320,000 pounds of Potomac M . . . on the shelf, ready for you. And, it's backed up by over 180,000 pounds of Potomac M billet stock, ready at the mill for finishing to your specifications, should the size, weight or shape of your order take it out of depot stock category. To learn how you can take advantage of this special stocking plan on tool and die steels, contact your local A-L Representative, and ask him about the Steelector Program and the job-shop availability of special sizes, or write Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.

Back-up stocks of ingots and billets insure job-shop delivery schedules on mill shipments. Here, Potomac M billet stocks at the Dunkirk Plant of Allegheny Ludlum await finishing operations.

A corner of an Allegheny Ludlum Warehouse, with part of the finished stocks of large Potomac M die blocks that permit customers to quote on short delivery jobs without expensive inventories.

STEELECTOR PROGRAM

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country

AL®

J702-4

Keeps the Noise Down

A sheet metal cone is instantly transformed into a complex shape at General Dynamics/Astronautics. The hydro-chemical explosive-forming process also keeps the noise down. A small amount of dynamite placed in the water, just above the die, does the trick. Muffled shock waves from the explosion blast the metal cone into the die. Missile parts 8-ft in diameter and 6-ft high are handled at the new facility.

MUFFLED BLAST: Forms complex shape.

A Vote of Confidence

The naming of Representative George P. Miller (D, Cal.) to be chairman of the House Space Committee is a vote of confidence for accelerated U. S. space programs. He has consistently voted on the side of bigger and better space moves. Besides his voting record, the congressman is from a large space-product industrial area.

Vacuum Cleans Space Craft

Spores and other life forms cannot withstand the rigors of space travel. Thus, the costly practice of sterilizing space vehicle surfaces may not be necessary. So say researchers at Hughes Aircraft Co. Experiments show that vacuum alone will kill bacteria and fungi, provided that pressures are low enough and exposure is sufficiently prolonged—often as long as 10 days.

Manipulates on the Moon

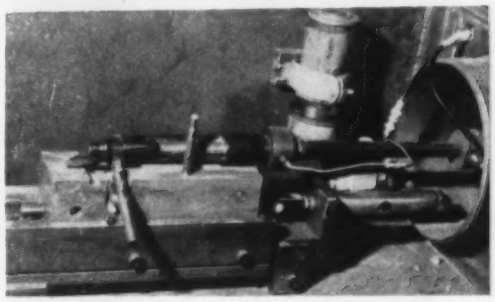
A manipulator designed to operate in outer space has been developed by General Mills. Set for use on the moon, the first unit will handle a TV camera. Others to follow will sample the moon's crust and perform internal and external repairs on satellites. The lightweight device uses special motors, bearings and lubricants to bear up against temperatures from +450° to −250°F.

Beryllium Gets the Eye

Beryllium wire is being explored for some new uses in the aircraft and missile fields. Special drawing methods combined with wrap-around applications produce tensile strengths to 200,000 psi. The lightweight metal is also a strong contender for airborne electrical wiring. Beryllium has about 40 pct of the electrical conductivity of copper but structural and heat resisting properties could be combined for special jobs.

Solid Fuel Strikes Harder

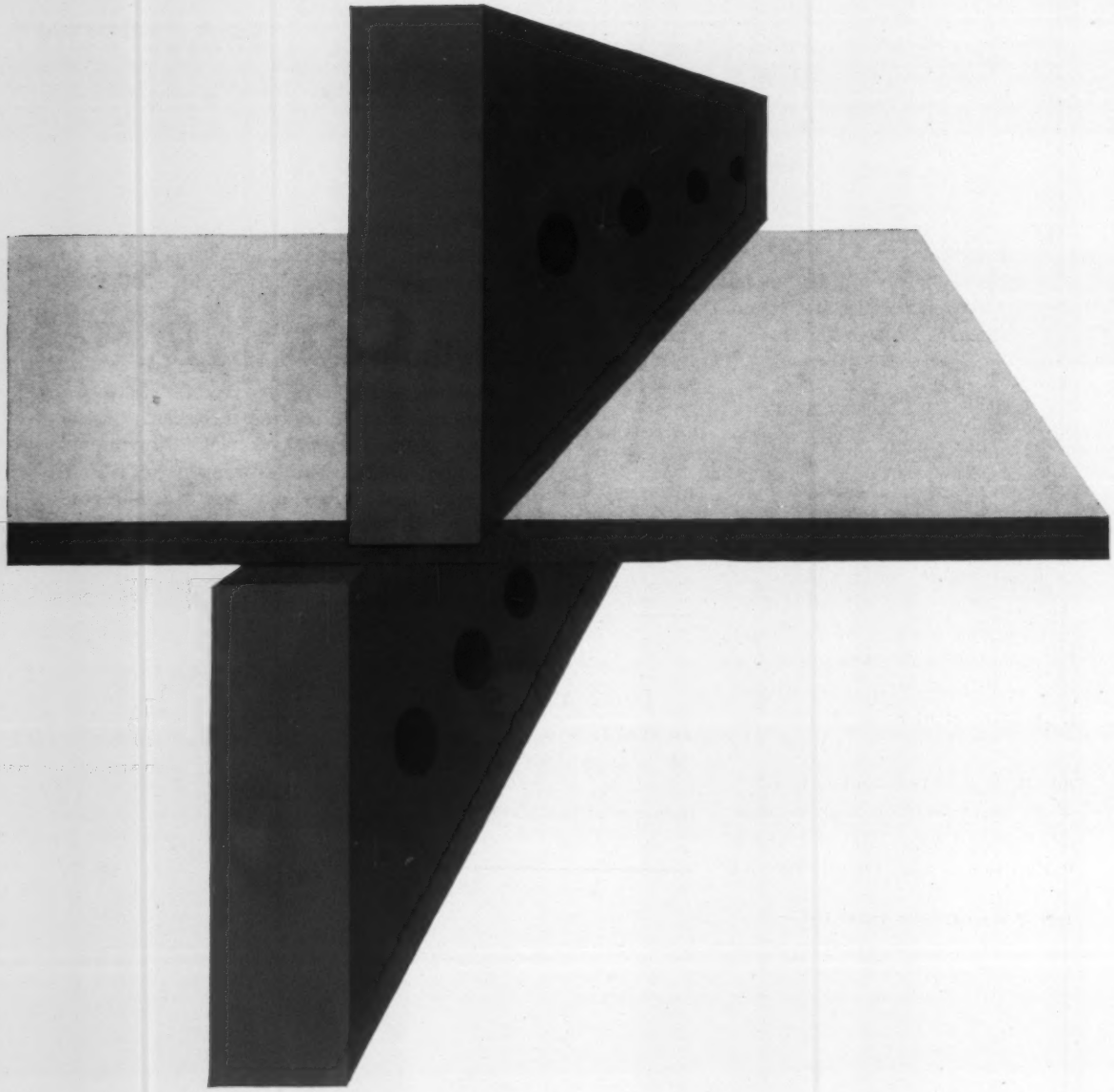
New chemical propellants, similar to some solid fuels used in rockets, increase the muzzle velocity of conventional weapons. Thiokol Chemical Corp. is using special equipment such as this modified rifle barrel, clamped in firing position to find the proper propellant. By increasing the weapons' muzzle velocity they'll prove more effective against supersonic aircraft, fast-moving targets and body armor.



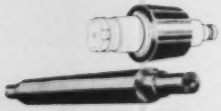
SOLID PROPELLANT: Pushes bullets farther.

NASA Rules on Patents

Industry is fighting an upcoming NASA ruling on patent regulations. NASA wants to grant exclusive licenses for space products to small businesses in labor surplus areas. Industry spokesmen opposed the plan right down the line. They called for a policy giving any company the right to use government-owned patents. "Exclusive rights" are said to be discriminatory and not in the best interests of the country.



Heppenstall rolls it, cuts it, handles it



Back-up roll sleeves and forged hardened, ground rolls

Side trimmer knives

Motorized sheet lifter

In the steelmaking industry — from melt shop to finished product — Heppenstall back-up roll sleeves and rolls, knives and tongs are proving their high performance value. To maintain such standards, Heppenstall has modern laboratories in each product division. All products are constantly checked — and intensive research is carried on to improve present products and to develop new ones. Heppenstall Representatives are fully experienced in the selection and application of our products to meet your problems. For service or specific information, call our nearest Representative or write us direct.

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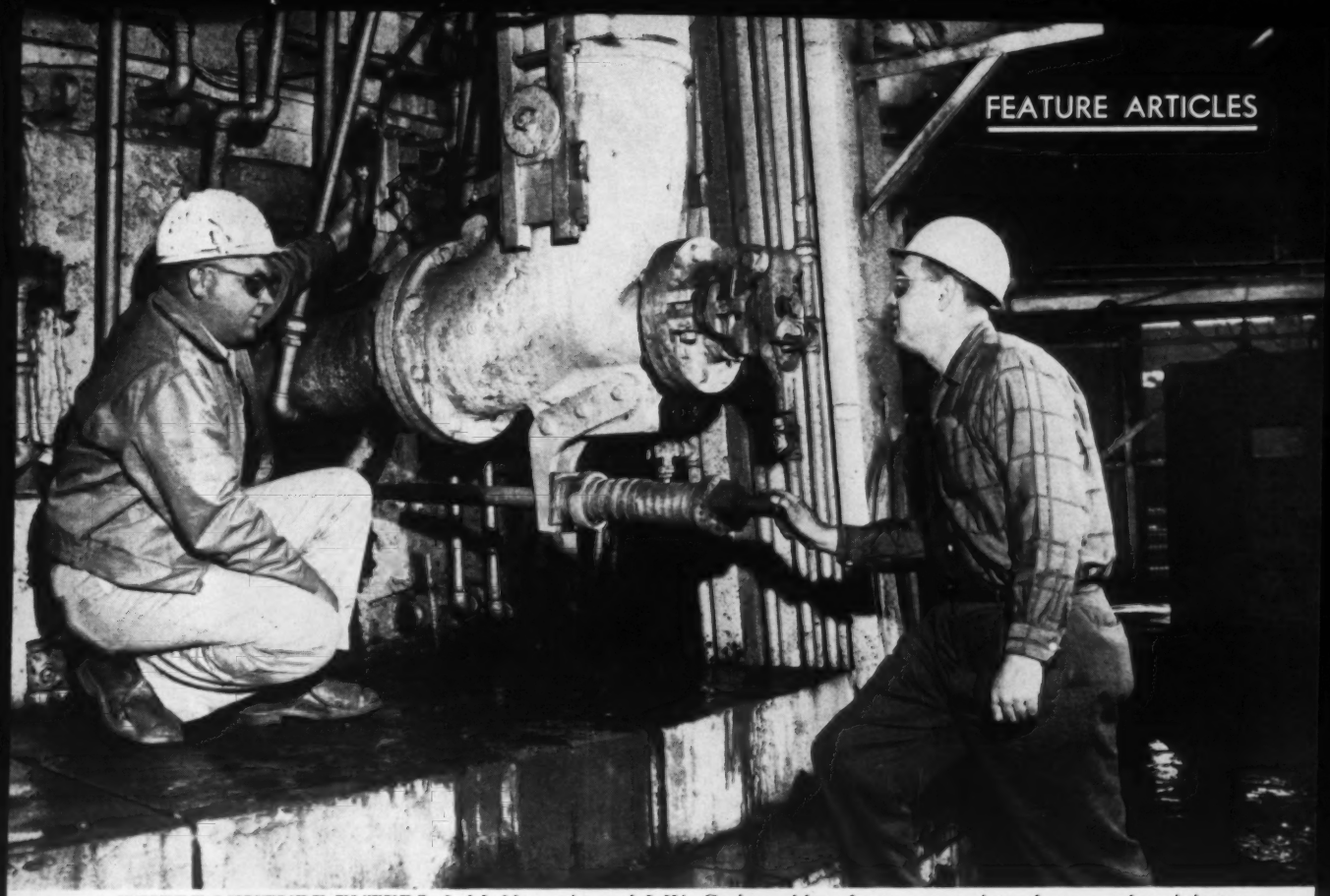


WHERE MIXTURE ENTERS: J. M. Negomir, and J. W. Carlson, blast furnace superintendent, regulate injector.

Oxygen Teams Up With Fuel To Hike Iron Output

Oxygen, already the darling of the steel industry, is making a bid for added laurels.

Now it's being used at CF&I to enrich fuel injection into the blast furnace.

By **C. L. Kobrin**
Metallurgical Editor

■ Fifty percent more iron, twenty percent less coke . . . these are the dramatic strides in blast furnacing recently recorded by Colorado Fuel and Iron Corp.

Taking the credit for these impressive results is the teaming up of oxygen and fuel for injection into the blast furnace tuyeres.

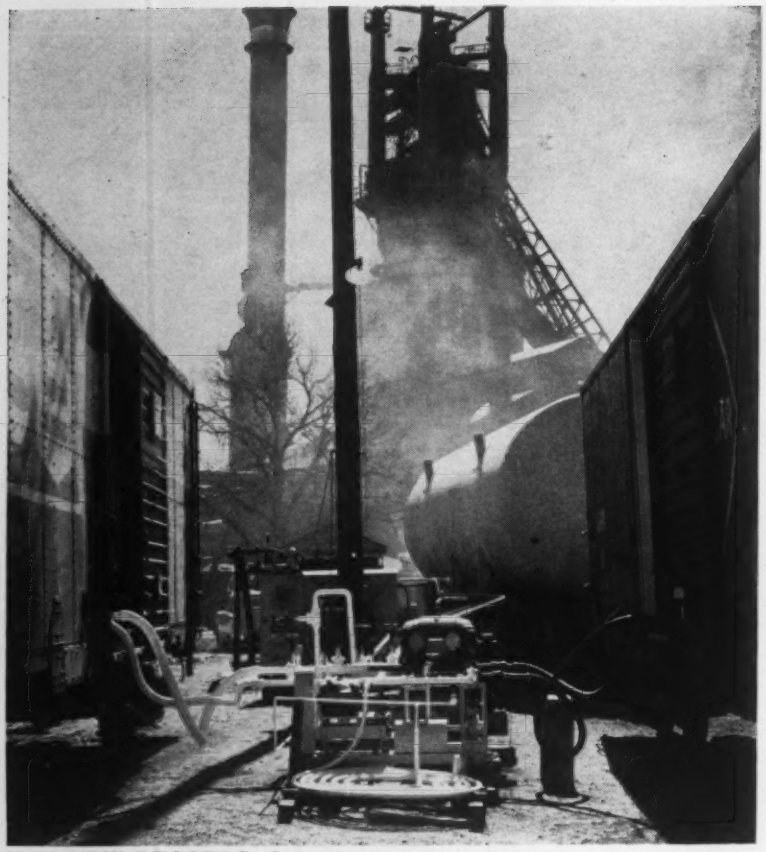
Latest Advance — Oxygen-fuel injection is the latest in a series of advances in blast furnace technology aimed at boosting hot metal production and cutting coke rates.

In the spotlight this past year has been fuel injection. It may be coke-oven gas (Pittsburgh Coke & Chemical Co.), oil (Dominion Foundries and Steel Ltd.), coal (National Steel Corp.), or natural gas (several companies).

Now, Colorado Fuel and Iron Corp., one of the pioneers in the use of fuel injection, finds that adding oxygen along with a mixture of natural gas and oil improves on the results obtained with just the gas and oil.

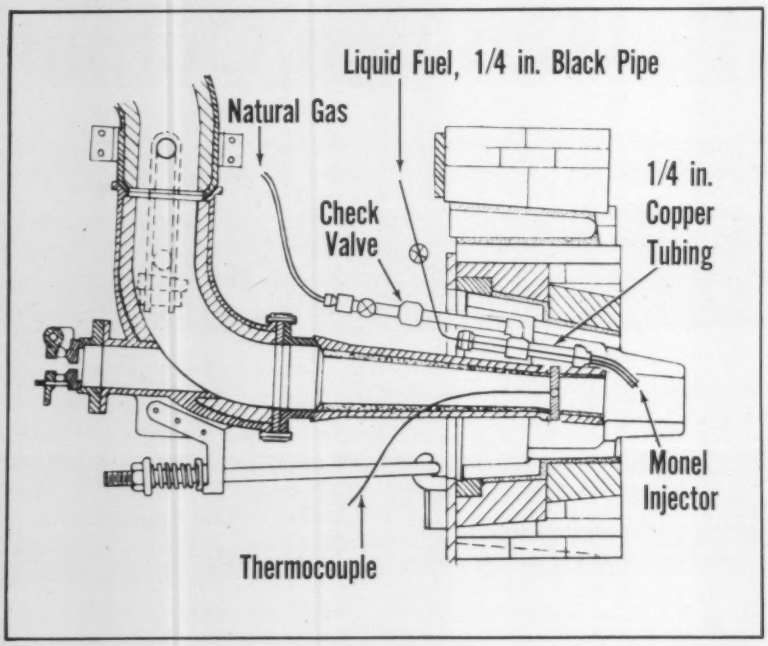
Special Stake — The Pueblo, Colo. plant has a special stake in the development. The recent start-up of a new basic oxygen steel plant will tax the capacity of existing blast furnaces. However, oxygen-fuel injection offers a means of obtaining greater production without building new capacity.

Computer studies at Linde Co. many months ago predicted the feasibility and advantages of using



SETS NEW RECORDS: Oxygen converter in foreground takes credit for boosting blast furnace iron production by 50 pct, cutting coke rate by 20 pct.

How Mixture Is Injected



oxygen in the blast furnace.

However, full-scale tests were never run until May 1961. At that time, a new Linde 280 ton/day oxygen plant, just erected for the then - uncompleted oxygen steel plant, was made available. And tests started on CF & I's "F" furnace under the direction of J. W. Carlson, blast furnace superintendent.

Sets New Record—"The normal output from 'F' furnace is 800 net tons of hot metal (nthm) per day," explains J. W. Carlson. "However, on September 3, the furnace reached a new high in production—1298 tons."

It's interesting to note that Pueblo does not have very large quantities of high grade ores. Yet, the furnace is performing well in spite of a very high slag volume, reports Mr. Carlson. And iron quality is not impaired.

Call For Lower Rates — The growing popularity of supplementary injection techniques can be attributed to a large extent to the historic cry by steelmen for lower coke rates.

Now that many coke ovens are getting old and in need of replacement, and the market for coke-oven by-products is getting thin, lower coke rates take on added importance.

For CF & I and other Western steel producers, there's an extra incentive. Located far from sources of coking coal and close to the oil fields, they find fuel injection a welcome development.

When "F" furnace hit its new high in production, it also hit a new low in coke rate—968 lb per nthm, explains Mr. Carlson. (The industry average is 1565 lb.)

Where Savings Accrue—The general rate of coke replacement has been 75 lb of coke per 100 scf of natural gas and 13 lb of coke per gallon of oil.

This saving in coke has led CF & I to postpone rebuilding of coke batteries, and development of coal resources.

How about cost? "The general experience at CF & I," answers Mr.

Carlson, "is that savings in coke make up about 20 pct of the oxygen cost; increased production about 50 pct; increased fuel value of the top gas about 10 pct. The remaining 20 pct will be offset by various other benefits and better utilization of oxygen production facilities."

Natural Outgrowth — Combining oxygen with fuel injection was the natural outgrowth of the needs of both processes. Injected fuels consume oxygen from the blast, thereby slowing the consumption of coke.

However, the amount of blast temperature available limits the amount of fuel injected. Here's where oxygen enters the picture. Fuel is consumed faster; the tuyere zone becomes hotter. Thus, it's possible to inject more natural gas and fuel oil. Results: More coke is replaced; production increases.

Use Sensible Heat — With this new technique of blast furnacing, maximum blast temperature can be used all the time. "This is important," stresses Mr. Carlson, "in that low-cost heat units are put into the furnace as sensible heat; that is, there is no additional mass of material to move through the furnace."

There's also another point. Using injected fuels rather than moisture with the oxygen allows the furnace to carry a heavier burden. The ore /coke ratio has been as high as 3.5 to 1.

Special Equipment — Playing a vital role in oxygen-fuel injection is the special equipment developed by CF & I.

The natural gas and oil injectors took nearly three years to develop. Many variations of lances and blowpipe injectors were used. But the final choice was a tuyere with a fuel injector near the rear.

The fuels, 2000-2500 cfm of natural gas along with 5-10 gpm of fuel oil, are injected through a port in the top of the tuyere. The natural gas atomizes and carries the liquid fuel into the furnace. They enter the blast four inches from the rear of the tuyere. (Sometimes tar is used in place of the oil.)

Surplus of Heat — "In general, natural gas is increased at a rate that would be completely burned up by the oxygen added to CO_2 and H_2O," points out Mr. Carlson. "This ratio leaves a surplus of heat to raise the temperature of the combustion products.

"The tuyere zone appears very active. But it is not hot enough to cause a hanging furnace. In fact, the furnace moves much more freely than before with low top temperatures."

Diffuses the Oxygen—The oxygen, up to 4600 cfm, diffuses into the cold wind between the blowing engines and the stoves. The diffuser is simply a pipe—with small holes along its length — which extends across the wind line.

The entire output of the oxygen plant is used whenever it is available. Generally, "F" furnace takes the bulk with only 1-2 pct going to another furnace.

All four furnaces at CF & I are equipped for oxygen and fuel injection. Two have used oil; a heated recirculating oil line is now being built for the entire furnace line.

Experiments are being continued with the goal of bringing oil usage up to as high as 35-40 gpm. The utilization of higher carbon fuels, such as powdered coal, is also being considered.

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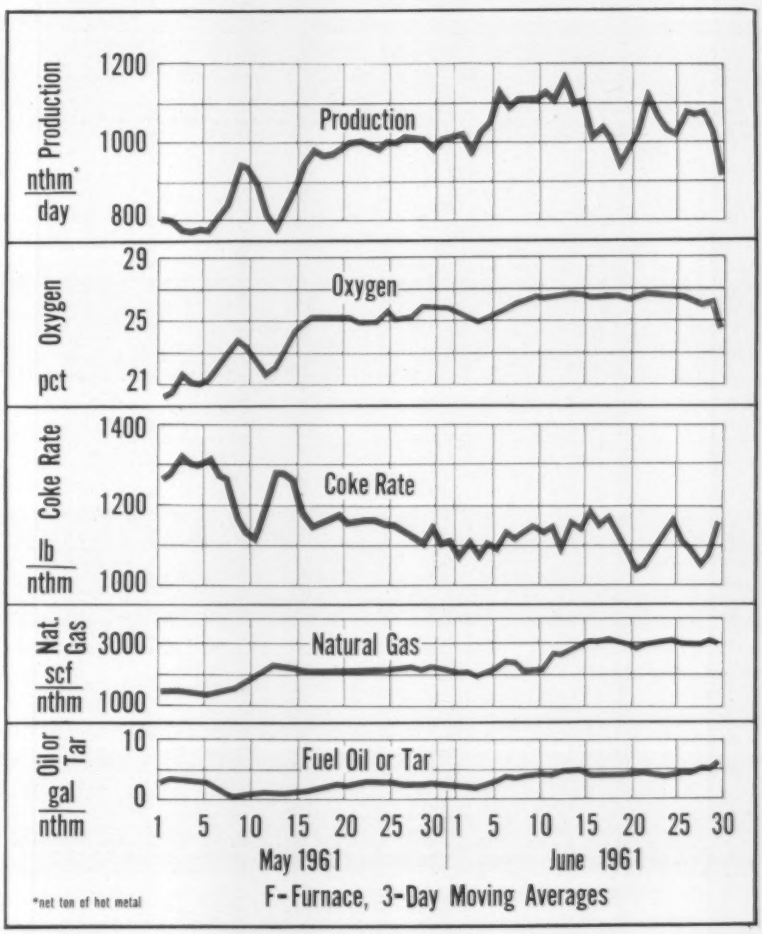
Oxygen Paces Rise in Output



NBS Conquers Metal Fatigue

When a metal part is subjected to repeated stress cycles, fatigue creates design woes.

Fatigue-strength levels may someday be greatly extended. Lab results look promising.

▪ Metal fatigue is the designer's nightmare. In fact, it's probably one of the biggest world-wide design headaches. But the National Bureau of Standards is working on a solution to this vexing problem.

A recent study, conducted by W. L. Holshouser and H. P. Utech of the NBS staff, may lead the way to some totally-new design concepts. These researchers report: "Dodecyl-alcohol coatings increase the fatigue life of various metals up to 500 pct."

Potential Killer—Fatigue plays a major role in the design of modern machine tools. It's also very important in space-age applications.

Today, most metals have to withstand wide variations in applied loads. Severe vibrations are the order of the day. Whenever a metallic part is subjected to high-frequency vibrations, stress fluctuations mushroom.

Consider an automobile's crankshaft. With average driving, fatigue stresses normally run into billions of repetitions per year. To work around such severe fatigue problems, designers commonly beef up critical parts. However, this approach creates waste in several forms.

Waste Breeds Waste—If an airplane designer beefs up an engine part by 100 lb, he cuts the aircraft's carrying capacity by about 500 lb. Why? Because structural members must be strengthened to support the excess engine weight. Other results of this overdesign include: Wasted material, high fuel consumption and the need for longer runways.

How can overdesign problems be cured—without risking premature equipment failure? The optimum solution would be to step up a metal's fatigue strength. Perhaps this solution is just around the corner. Let's check the results of the latest NBS fatigue-test research.

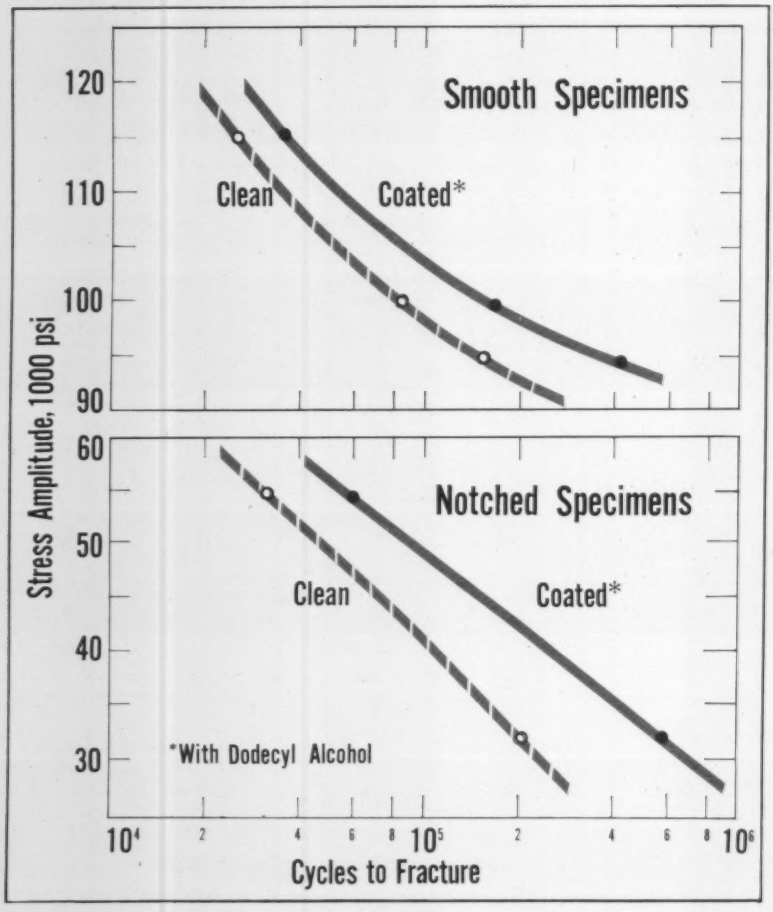
Messrs. Holshouser and Utech state: "Certain organic liquids such as dodecyl alcohol reduce the rate of fatigue-crack propagation. These liquids increase the number of fixed-load cycles needed to produce fatigue cracks in various metal test bars."

Check Lab Results—Early findings show dodecyl-alcohol coatings can be used to protect steel, stainless steel, aluminum and beryllium-copper alloys. Specific test data appear in table form.

A liquid coating can be easily applied to a test bar's surface. As the test results indicate, this protective coating increases fatigue-life values by factors ranging from 1.4:1 on stainless steel to 5:1 on a copper-beryllium alloy.

Fatigue failures are rather complex. They're progressive and consist of two phases. The first phase, crack initiation, covers the period from the start of a stress applica-

Alcohol Extends Fatigue Life



tion to the appearance of the first crack. This initial crack ultimately causes part failure.

The second phase extends over the period of crack propagation. It terminates with the abrupt fracture of the part. In lab tests, the duration of each phase hinges on the type of test specimen used.

Standard Bars — Two types of test bars are normally used to obtain fatigue data. One bar is completely smooth. The other type has a sharp notch in its cylindrical midsection.

Notches serve as stress raisers. The effective stress at the root of a notch greatly exceeds the nominal stress applied to a test bar. This also speeds up comparison tests.

In the study, tests were conducted on specimens of 4340 steel, 17-7 PH stainless steel, 6061 aluminum alloy and a copper-beryllium alloy with 1.75-pct Be. Both smooth and notched bars were tested.

All of the coated and uncoated notched bars measured 0.365 in. in diameter. Notches around the middle reduced these diameters to 0.250 in. To prevent surface-finish variations and to equalize cold working, the 0.005-in. radius at the root of every notch was ground.

An Explanation—Why do dodecyl-alcohol coatings retard fatigue-crack initiation? The NBS researchers advance a simple theory. It's thought that the polar compounds form films on the metal. These films prevent harmful reactions between the metal and the atmosphere.

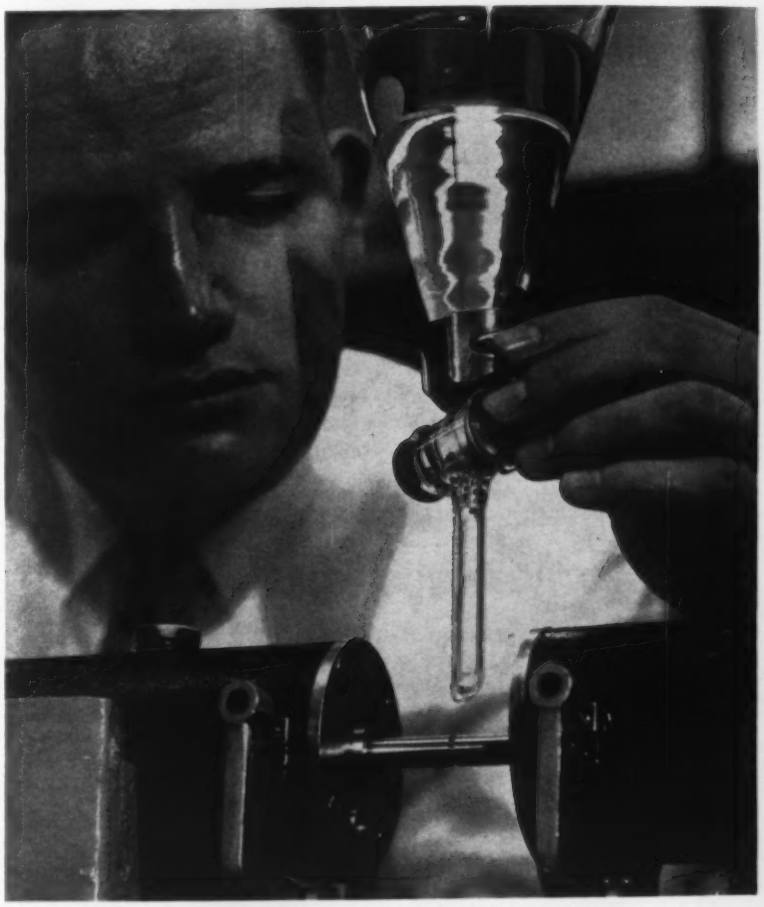
The thin films limit the access of oxygen or water molecules to the metal's surface. This reduces the rate of detrimental surface reactions that normally occur when specimens are stressed in air.

Prior to crack initiation, the thin-film guards do the most good. During the crack-propagation phase, however, each increment of crack extension opens up an area of clean metal surface. This exposed surface area is then free to react with oxygen in the atmosphere.

Thin Coatings Retard Cracks

Material	Nominal Stress Amplitude	Thousands of Cycles of Stress						Ratio of Np Values Coated/Clean
		Clean			Coated with Dodecyl Alcohol			
	1000 psi	Nf[a]	Nc[b]	Np[c]	Nf[a]	Nc[b]	Np[c]	
4340 Steel	32.5	210	10	200	586	10	576	2.9:1
	55	33	2	31	63	2	61	2.0:1
Cu-Be Alloy	30	749	78	671	3406	78	3328	5.0:1
	50	27	3	24	39	3	36	1.5:1
6061-T6 Aluminum Alloy	11.5	358	18	340	632	18	614	1.8:1
	17	81	4	77	120	4	116	1.5:1
17-7 PH Stainless Steel	42.5	115	40	75	325	40	285	3.8:1
	52.5	32	12	20	39	12	27	1.4:1

[a] Nf = Median fatigue life (5–7 specimens).
[b] Nc = No. of cycles required to produce a detectible crack.
[c] Np = Nf-Nc (crack propagation portion of fatigue life).



UNDER COVER: Alcohol film is maintained on a test bar. Each specimen was tested on a rotating-beam machine, operated at 3000-rpm rate.

Can Molybdenum Be Protected From "Puff of Smoke" Ending?

By **Gerald Geltman,** Consultant, Hackensack, N. J.

"Puff of smoke" best describes what happens to molybdenum when heated in air to 1400°F.

Tests show that a composite coating may be one answer to the problem.

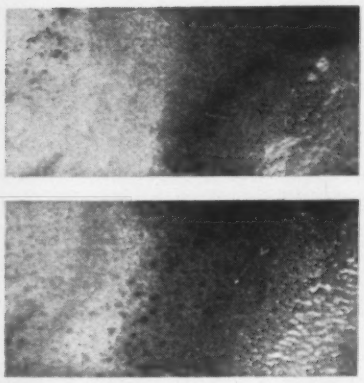
■ The higher the operating temperature of an internal combustion engine the greater its efficiency.

Thus, molybdenum with its very high melting point should be an ideal candidate for turbine-engine blades, guide vanes and ramjet nozzles.

There's a fly in the ointment though. Molybdenum oxidizes catastrophically way below its melting point. And since the oxide forms rapidly and its vapor pressure is high, it evaporates rapidly.

Puff of Smoke—Any unprotected molybdenum specimen heated to only 1400°F in air will go up in a puff of smoke. It's been reported, for example, that in slowly moving air at 1800°F the surface of molybdenum recedes at the rate of 0.02-0.05 in. per hour. Compare this to an iron - chromium - nickel alloy which recedes only 0.000013 in. per hour at 1800°F.

Alloying molybdenum may be one way to protect it from oxidation. Another way that's getting considerable attention these days is to develop special coatings.



PASSES TEST: Composite coating of chrome diffusion coat and ceramic passes brutal torch test.

Coating Criteria

Resistant to temperatures greater than 2000°F for hundreds of hours

Impermeable to liquids or gases

Resistant to thermal shock

Adherent

Resistant to impact shock

Chemical stability

Self-healing feature

Use in neutral or reducing atmospheres

Non-interference with initial preparation and heat treatment of molybdenum

The ideal coating must meet stringent conditions. The table lists some criteria for such a coating.

Successful in Past — Ceramic coatings first applied to molybdenum and its alloys were versions of some which had proved successful for certain cobalt- and nickel-base alloys.

Double and triple coatings were required because if such a coating is less than one mil thick, a pinhole in it can be disastrous.

The last picture is an example of a typical pinhole failure. What remains is nothing more than a collapsed shell of coating. The molybdenum completely disappeared through the pinhole.

Screen the Candidates—Preliminary screening of these ceramic coatings was done by testing in air at 2200°F. The test lasts for a maximum of ten hours unless, of course, failure occurs.

Most of the adapted standard ceramic coatings failed in less than 8

How to Make Diffusion Coats

	Vapor Pressure: 1 mm	Temperature*, C 10 mm	760 mm	Melting Point, °C
Molybdenum	3102	—	—	2622
Molybdenum trioxide	734	814	1151	795
Aluminum	—	1487	—	660
Aluminum oxide	2148	2385	—	2050

* Temperature at which the compounds have the vapor pressures listed.

hours. One group did not. But after heating in the oxidizing zone of an oxyacetylene torch for about 5 minutes, the coatings were destroyed and the molybdenum proceeded to evaporate.

Even for lower-temperature use, straight ceramic coatings have a drawback. They're hard to apply to all interior surfaces and holes and have a high glass content.

Diffusion Technique—One way to overcome the shortcomings of ceramic coatings involves a chrome-diffusion technique.

Chrome pack diffusion takes place in batch-packed retorts. A hydrogen flush afterwards or flushing with slowly moving hydrogen during the entire process helps obtain oxygen-free diffusion coats. Titanium also helps to remove oxygen and nitrogen.

The second table lists some different diffusion processes tested. Shorter times or lower temperatures than those shown result in poor coatings.

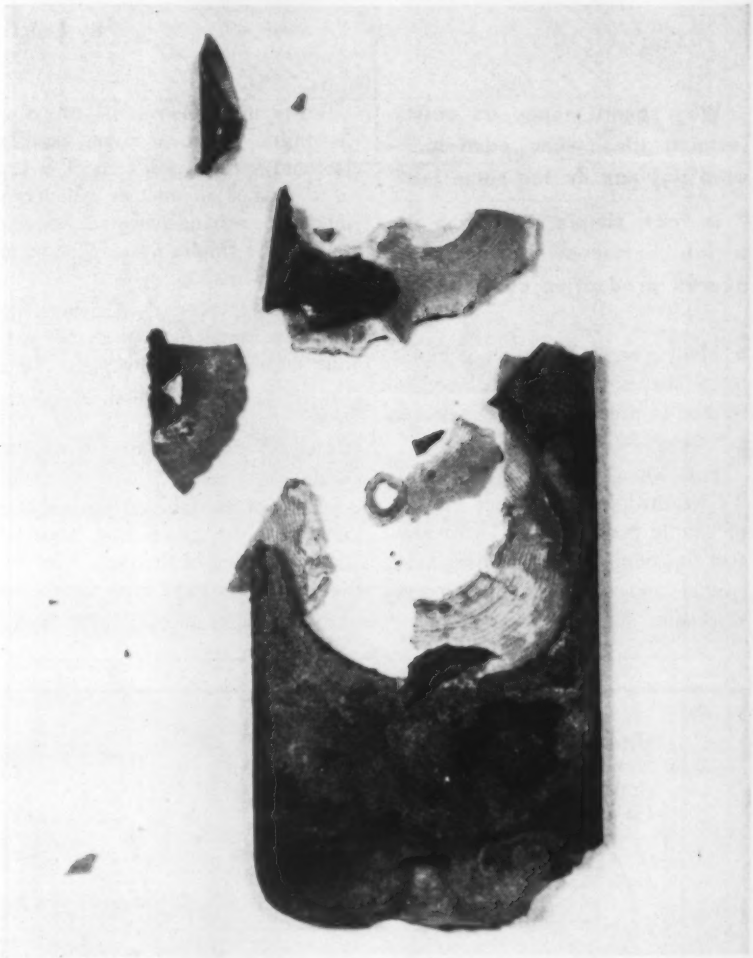
Poor Performance—"Erratic-in-performance" best describes diffusion coatings at 2200°F. In some cases, they last for 10 and 12 hours; in some instances they fail after 4 hours. Attack of the substrate proceeds only at exposed molybdenum edges.

Another approach is that of a composite coating—to apply an improved, almost glass-free ceramic coating over a chrome-diffusion base. Despite relative ease of application, the coatings were porous and fragile; adherence to the parent metal was non-existent.

Anchors the Ceramic—Suppose the procedure is reversed. One technique calls for applying the nearly glass-free ceramic coating followed by one half-hour of diffusion treatment. Another, and this was found to be more successful, is first to coat with chromium, then ceramic. Finally, a second chromium-diffusion coat anchors the ceramic to the substrate.

These coatings held up very nicely to exposure to 2200°F for ten hours. They also withstand the brutal oxyacetylene torch which was the downfall of the ceramic coatings without diffusion treatment.

It appears then that a composite coating of the type described is one step in the right direction.



PINHOLE FAILURE: Slightest pinhole in ceramic coating allows molybdenum to vaporize. Hollow shell of ceramic remains. Test was at 2200°F.

When Metal Boils Away

	Procedure and Batch Composition					
Number	Chromium,* Pct	Titanium,* Pct	ZrO_2,** Pct	Cr Cl, Pct	Time, hours	Temp., °F
XD4	48	2.0	48	2.0	1½	1900
XD6	50	2.0	43	5.0	3	1850
XD7	48	1.0	46	5.0	1½	1900

* −350 mesh, +99 pct pure.

** Between 150–250 mesh.

Small Jigs Replace Costly Dies

By **Federico Strasser**—Consultant, Santiago, Chile

Why spend money on costly forming dies when hand-operated jigs can do the same job?

In fact, simple jigs often do a job better—while reducing overall production costs.

■ Many people think all complex metal shapes must be machined or formed in press tools. These people are away off base.

For some special applications, it's worthwhile to consider the use of simple bending jigs. These low-cost jigs offer advantages over most special and some standard press-work dies.

Easy to Build—It's surprising how little is known about bending jigs and fixtures. Let's check a few of the chief advantages which are inherent in hand-powered bending jigs. These simple jigs can be made in your own shop.

Using a properly-designed jig, you can form complex shapes with one setting of the workpiece. Since the jig is self-contained, you don't have to coordinate its use with other power-actuating machine tools.

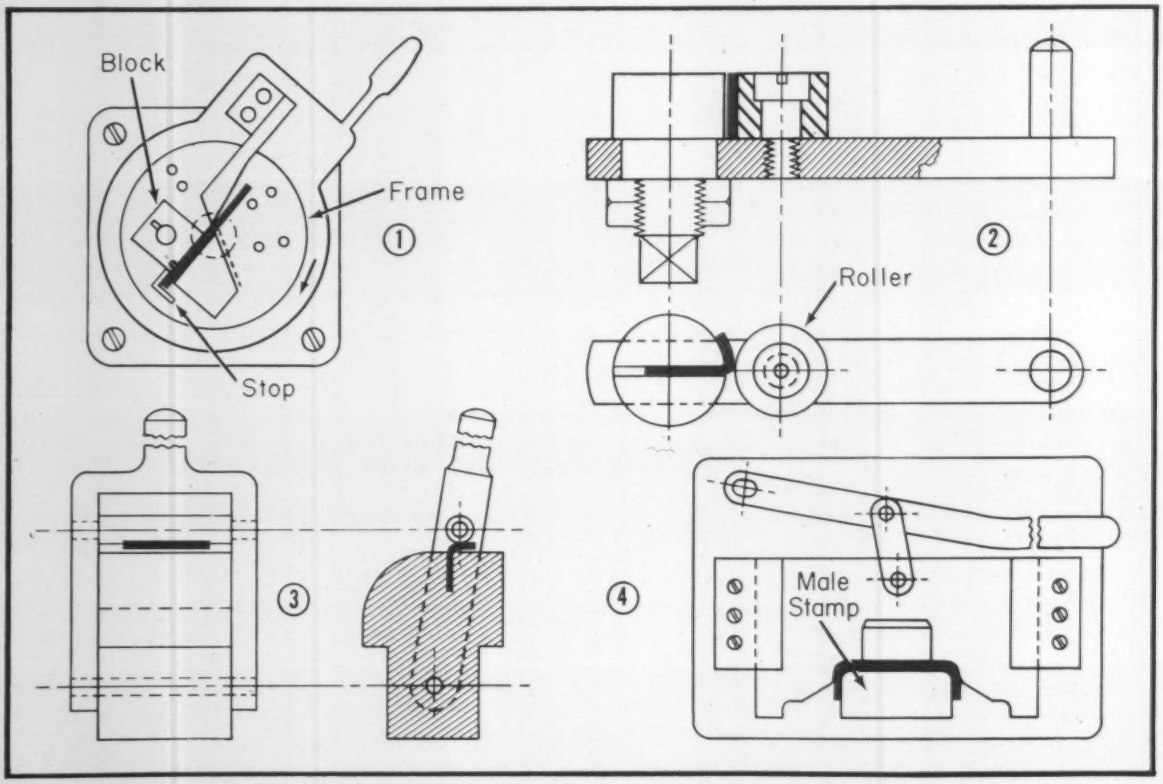
Each of the tailored jigs is always ready for use. Die-setting labor becomes a thing of the past. And die-setting errors can't crop up.

Storage is another plus factor. The simple bending fixtures are small. They occupy little space. Due to their light mass, they're also easy to transport.

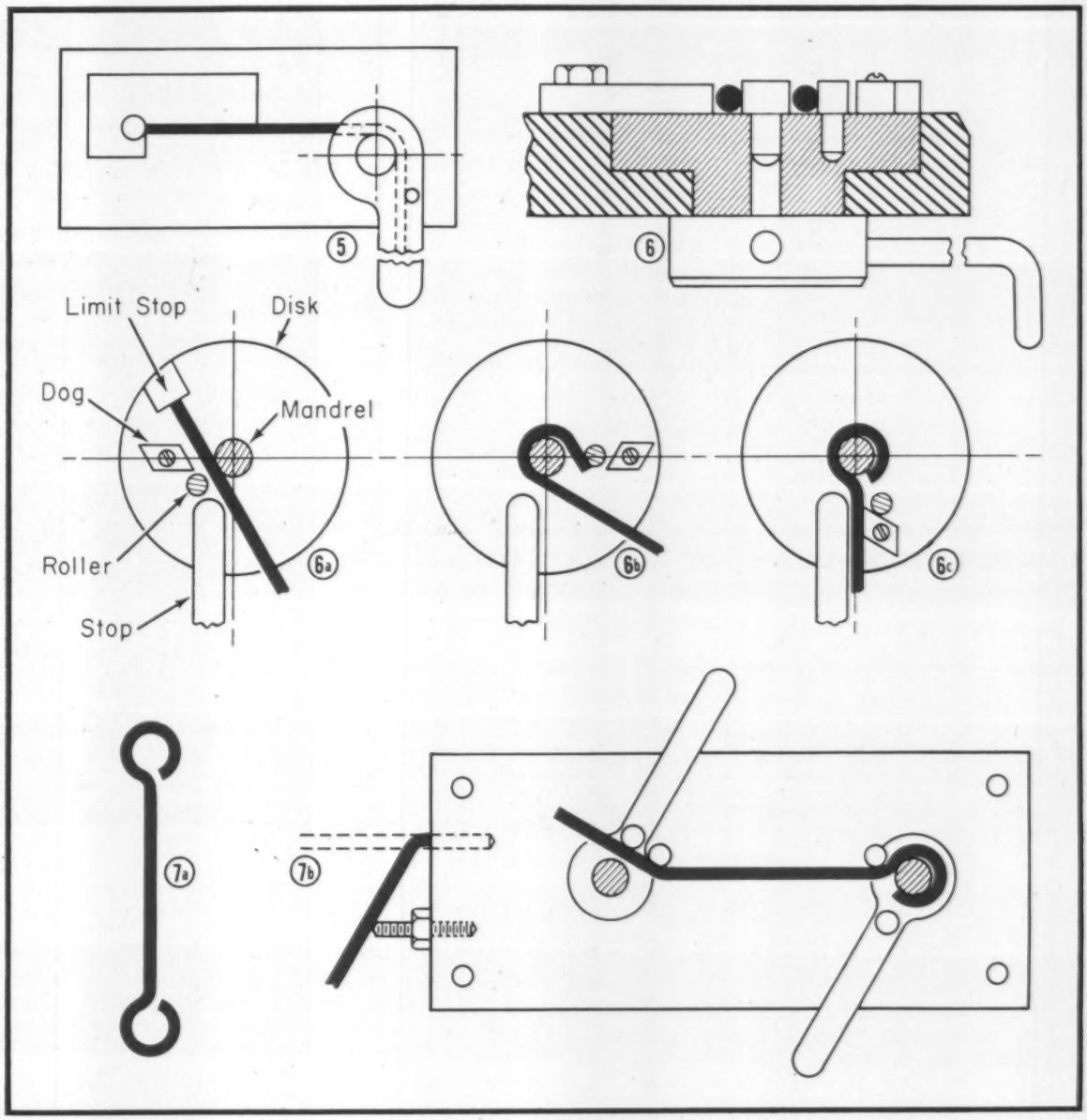
Safe to Use—What about serious accidents? Since these jigs are operated by hand, accident rates tumble.

One of the biggest advantages of small bending jigs centers on cost. It's a lot easier—and less costly—to build a hand-operated jig than it is to construct a corresponding forming die.

Now, we'll move along to production rates. Output from a properly-designed bending jig equals or exceeds that of an ordinary forming die. Savings are noteworthy.



SHEET SHAPES: Simple bending jigs can be used to form various shapes with only one setting of the workpiece. Fig. 4 illustrates a low-cost jig for forming U-bends by means of a single, hand-actuated lever.



WIRE FORMS: Hand-operated bending jigs can also be used to form wire shapes. A quick pull on a lever forms hooks or loops for terminal connections. Dual levers team up to yield shapes like fig. 7a.

Pressing Problems — The drawings with this text illustrate a few simple jigs. These jigs overcome the traditional bugaboos which are all too common in press-work applications.

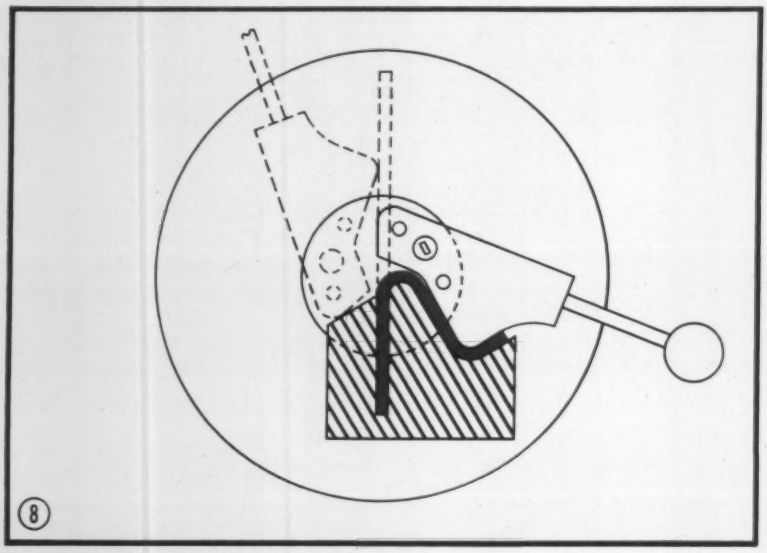
Some of the most common press-work headaches include: Small work runs that can't write off press-tool amortizations; short delivery schedules which don't allow enough time to prepare proper press tools; tiny or extra-large workpieces that present special handling problems; irregular shapes such as nonsymmetrical contours; and complex compound-forming shapes.

Basic Parts—Let's run through the main components of a bending jig. First, you need a base. Don't forget to allow a provision for fastening or clamping the base to a work bench. Quite often, a vise-held block proves satisfactory for short workruns.

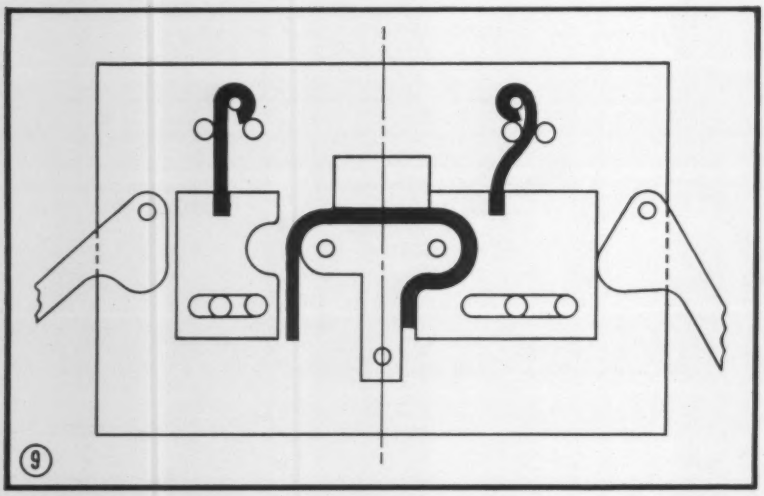
Stops or nests for the flat (or preformed) workpiece are a must in every bending jig. Usually there are two stops in each jig. One stop is stationary: It's mate is movable.

The jig's spindle or shaft is the key to successful forming operations. It's position may be vertical or horizontal to suit your working conditions.

Variations—One or two bearings can be used to support the shaft. Frequently, there are two or more shafts or spindles in a single jig. In



COMPOUND BENDS: With one rotating movement, several bends are made in the same workpiece. All the operator does is pull the handle.



DOUBLE YANK: Cams on a pair of levers actuate pin-guided forming slides. This jig makes two double bends on preformed U-shaped blanks.

other cases, a slide which moves in a reciprocating straight line takes the place of the forming spindle.

Naturally, you've got to have a handle to move the spindle or slide. You may also need clamping devices to hold the workpieces firmly inside the jig's forming nest. If you're going to form heavyweight parts, a mechanical advantage must be employed.

Now, we'll study some typical bending jigs. The first figure shows a rotary bender. It handles simple bends of almost any angle between 10°-180°. The stationary stamp, around which the bend is made, is the only member that must be changed from one job to another.

An adjustable stop fixes the length of the unbent leg. Major stock-thickness variations are taken care of by adjusting the backup block. Bending occurs as the rotating frame's ring carries the actuating finger in a smooth arc.

Pull the Handle—In the second two-part illustration a roller, located on the actuating lever, makes each bend around a central shaft. The blank is placed in a slot in the top of the central (fixed) shaft. This type of jig is easily inserted in a bench vise.

The third bending jig works on the same principle. It's recommended for longer workruns. And it's also easily held in a vise.

Next, let's study a U-bend fixture. As a case in point, consider the fourth illustration. The male stamp is a stationary steel block. Machined into a slide, aligned by two guides, you'll find the female stamp. A stop for the blank is also machined in the forming slide.

Wires Shapes Too—Bending jigs can also earn their keep as wire formers. Fig. 5 shows how a pin under a forming handle makes smooth bends. The length of the unbent leg can be varied by using pre-selected filler blocks next to the end stop.

The next four-part illustration shows how to form hooks or loops for electrical wires and terminal leads. Each wire end is inserted between a stationary—but adjustable—stop and a forming mandrel.

After the wire end is pushed against the stop, the operator activates a disk which carries a roller and a dog. As the disk turns clockwise, the roller forms the loop around the mandrel. Then at the final stage, when the loop is almost complete, the dog bends the wire body against the stop.

How can you form double-looped terminals? Consider Fig. 7. First, both ends of the wire receive angle bends, as shown on the left side of Fig. 7b. Then the operator inserts the wire preform into a double-handled jig. He curves the two loops around small pivot pins.

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Automation Speeds Repair Work

Most companies supply repair and replacement parts for old-model and odd-ball units.

How should a company handle this expensive job-lot work? Automation may be the answer.

■ The reputation of a company hinges on quality products, backed up by prompt and reliable service.

Even the best equipment sometimes requires repair. If the idle equipment was made to order, spare parts can't be pulled off the shelf. Special designs and very old models also create repair-shop snags.

Move Fast—When a customer's equipment isn't operating, he wants results—not excuses and delays. If your company makes a wide range of odd-ball, built-to-order machines, you've got to turn out small-lot repair parts. And you can't waste any time.

The production of replacement parts is the prime function of the Caterpillar Tractor Company's Davenport, Iowa, plant. This company is the world's largest maker of earth-moving equipment. Over the past 50 years, Caterpillar's output includes hundreds of machine designs.

Thousands of repair parts are needed to keep all of these diversified earth-toting machines on the move. Without proper planning, replacement parts could be a source of friction between the company and its customers. Small-lot repair parts can also become money losers.

Automation's Role—Here's how the company solved its replacement-parts problems. Six automatic turret lathes produce the bulk of the replacement parts. All six of these single - spindle - chucking machines were made by The Warner & Swasey Co., Cleveland.

Why use automatics? Many of the older parts prove costly in small lots. Thus, it behooves the manufacturer to make these parts as efficiently as possible.

Switching to automation for these short workruns quite naturally involved the support of sound scheduling. As soon as a job runs out on a machine, a new job—and all its tooling—is placed alongside the machine, ready to go.

Tabulated Data — Every operator receives a table of speeds and feeds for the materials and the cutting operations which must be employed. In addition, a work order provides standard performance data. These data include: Hours allowed for setup, normal output rates and a "how to" tooling-setup sheet.

One operator handles two machines, without any tooling worries. All cutters are maintained by a centralized-grinding department. Inspectors check the tooling after each job.

Materials encountered in an average working day include: Cast iron, cast steel, malleable iron and steel forgings. If a spec sheet calls for bar stock, it's first slugged to size.

Future Plans—Throw-away tooling with premium-grade carbide serves for some turning and facing operations. It's expected that more and more jobs will be tooled with these throw-away cutters. At that time, all machining speeds will be increased.

What happens if a cutting tool fails during a production run? All the operator does is signal a need for new tooling. Immediately, a replacement from the tool crib is at his fingertips.

How does the company like its new automatics? Mr. C. E. Murray, plant mgr., states: "Going automatic was the only way to keep costs in line. Automation lets us maintain optimum reliability while keeping some semblance of a production schedule on short runs."

SMALL WORKRUNS: Automatic machine tools thrive on short runs. However, to make them really pay off, you've got to use sound scheduling.

Oscillating Stone Shapes Parts

Honing Action Corrects Out-of-Round Conditions

Do you have to shape and polish small-diameter workruns to ultra-tight tolerances?

If so, you should consider using a microstoning machine. This equipment is well suited to precision-finishing work.

▪ Rotating small metal parts beneath an oscillating microstone yields surface finishes of 1 microinch or better. With abrasive action, the microstone shapes itself to a part's circumference. Then it levels all the hills and valleys left by prior machining operations.

Under a constant flow of fluid, the microstone polishes large workruns. Here's a typical application. Microstoning has been used to correct the roundness of thousands of double-diameter spools to within 0.00002 in., at speeds up to 900 finished parts per hour.

This work was done at the Taft-Pierce Mfg. Co., Woonsocket, R. I. All of the double-diameter spools were microstoned on a Taft-Pierce/Supfina plunge-cut machine.

Perfect Finish—Let's check out this precision-finishing work. Microstoning improves every spool's finish to 1 microinch from a centerless-ground finish of about 10 microinches.

Centerless grinding is precision work. But it leaves out-of-round conditions of about 100 millionths on the 0.595- and 0.333-in. diam spools. Microstoning corrects this condition to 20 millionths of an inch or less.

A microstoning machine is basically a centerless device that uses a cycling principle to achieve both metal-removal and final polishing actions. All workpieces rotate beneath the oscillating microstone. Two microstones team up in cases where two different working surfaces are finished at the same time.

Slow Start—At first, the microstone rotates at a relatively slow speed. During this cycle, abrasive action shapes the stone to the work's circumference. Normally, the low-speed cycle is set for a 1½- to 30-second time period.

Precision shaping of the work in process also occurs during the initial time period. In leveling the tiny hills and valleys, the abrasive microstone removes unwanted, excess metal. It corrects lobular conditions to within 0.00002 in.

Except for the high spots which cause out-of-roundness, the bulk of the metal that's removed is amorphous skin. The heat generated by preceding metal-removal operations creates this skin condition.

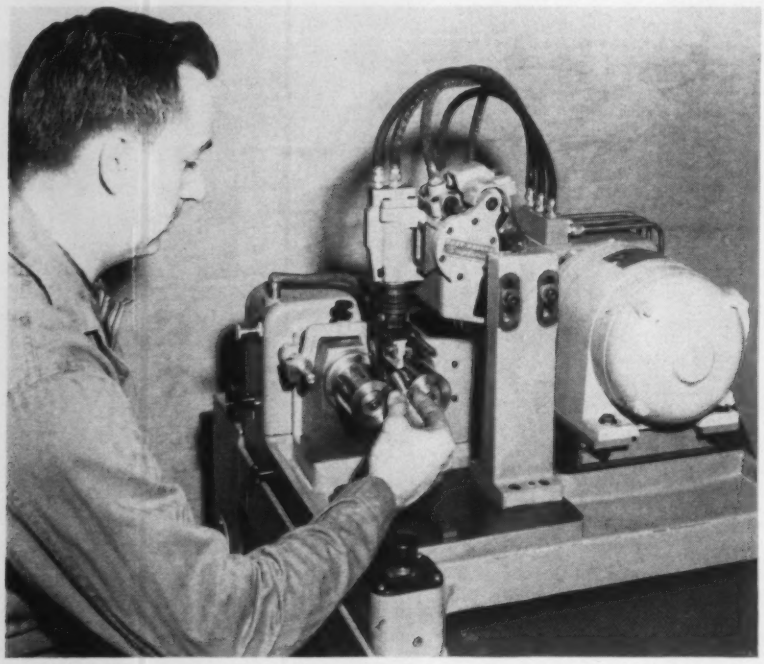
Ready for Use—Skin removal offers a major benefit to the end user. (In this case, the finished spools serve in hydraulic systems.) Skin-free parts don't need to be "run in."

Since most of the metal that's removed is only skin, it's rarely necessary to size the finished parts. Tolerances which were held in machining are maintained during microstoning.

After the shaping period is completed, the rotation speed builds up three-fold. With faster rotation, the microstone produces a polishing effect. This imparts a high degree of luster on the workpieces.

Dual Factors — More than 900 different microstone grits, bonds and sizes are available. Through proper stone selection and the regulation of a preset time for each operation, finishes can be maintained to precise standards.

In some cases, microstoning even replaces grinding operations. The wide range of stone selections cou-



FAST WORK: In a matter of seconds, the plunge-cut stoning operation corrects all lobular out-of-round conditions to within 0.00002 in.

pled with closely-timed working cycles, makes this finishing process ideally suited for cylindrical workpieces.

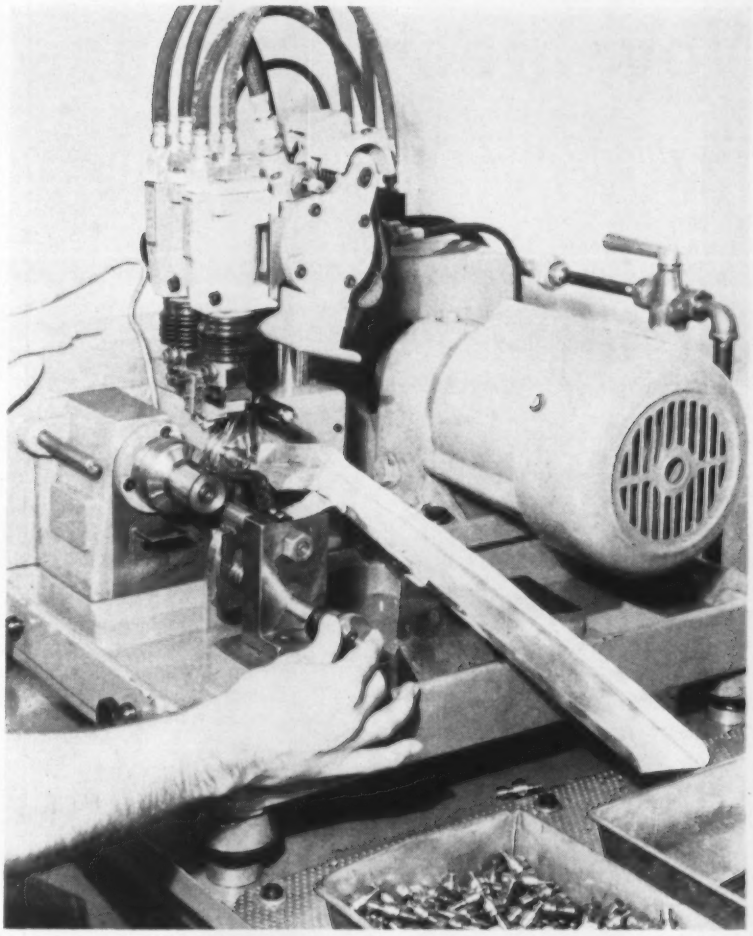
For uniform cylinders, the microstoning machine's stock rolls prove readily interchangeable. They handle parts from ⅛- to 1⅛-in. diam. A pair of rolls accommodates diameters within a range of 0.001 in.

Special rolls are made for contour work. With these specials, you can microstone tapers, shoulders and other complex shapes.

Always Parallel—Now, let's get to the heart of the plunge-cut machine. Its base is permanently mounted. This insures microstone travel that's exactly parallel to the axis of the work rolls.

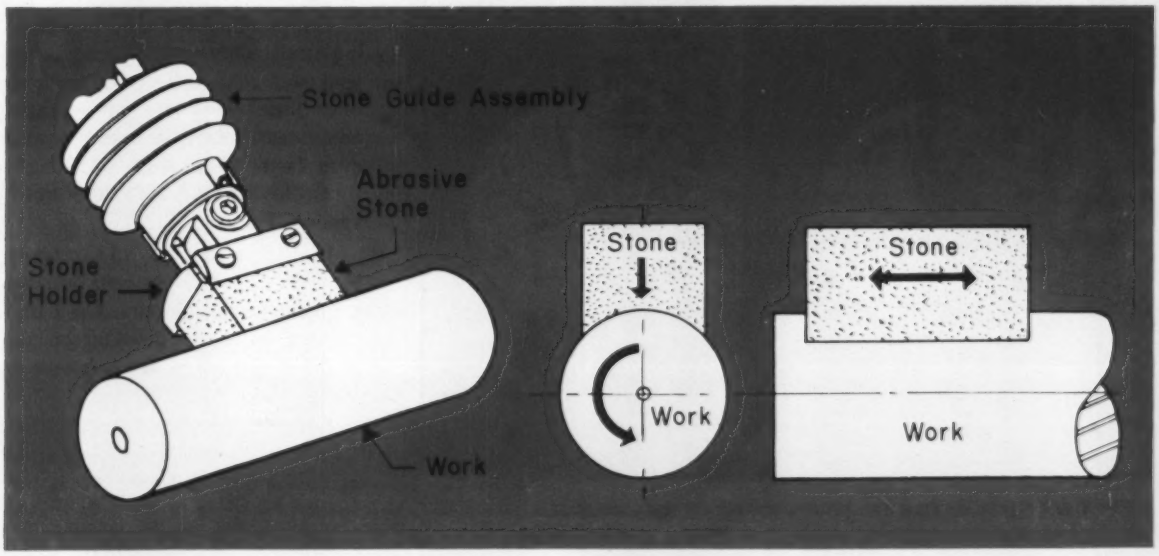
A free-floating piston eliminates extraneous vibrations. This setup is so efficient that the oscillating machine can even be used near delicate lab instruments.

Microstoning takes place under a constant flow of fluid. The fluid carries away both microstone and metal particles. It also reduces friction in the area where the microstone contacts the work. Since microstoning is a low-temperature operation, the fluid doesn't have to serve as a coolant.



PARTIAL AUTOMATION: A simple fixture positions double-diameter cylinders under the microstone. Sheet-metal chute feeds a storage bin.

Stone Shapes Itself Around the Workpiece



New Steel Machines Faster

Alloying With Tellurium Is Key To Record Performance

Test results from 20 shops on a new machining steel show drastic gains in speeds and feeds.

Impact will be felt by machine designers too.

▪ The wraps have been pulled off La-Led X, a tellurium-bearing, free-machining steel this week. Rated at over 600 sfpm, the material is now available in production quantities.

The product is the result of seven months of tests—in 20 shops across the U. S. It's been proven so far that: Screw machine operators can multiply machine speeds by as much as 350 pct; feed rate can be increased by at least one-third.

White Brass—One auto manufacturer reports reducing machining time from 22 to 14 seconds on a screw machine part. Rejects were cut to almost zero. Another source suggests that the steel is so machinable so as to merit the title "white brass" or "butter cut."

Results reported by La Salle Steel Co., Chicago, who pioneered the field testing, have tool men asking if the steel's producer, Inland Steel Co., may have another Ledloy.

Leaded steels, first produced by Inland in 1938, offered a major gain in cutting speeds over resulphurized openhearth steels that were and still are important machining stock.

Calls for Review—According to La Salle Steel Co. president Thomas Kelly, "We have invested a lot of time, money and effort on tests to explore . . . the machinability characteristics of this tellurium-bearing steel. . . . Companies which make or specify parts will need to review present materials and production methods again in view of the development of this new steel."

Cone Automatic Machine Co., Vermont screw machine manufacturer, made some tests with the new steel. Comments Cone manufacturing vice president R. R. Rhodehamel: "The product development group at Cone right now is working on a series of heavy-duty, high-speed, fast-index machines to be in position to accept the challenge of these new steels."

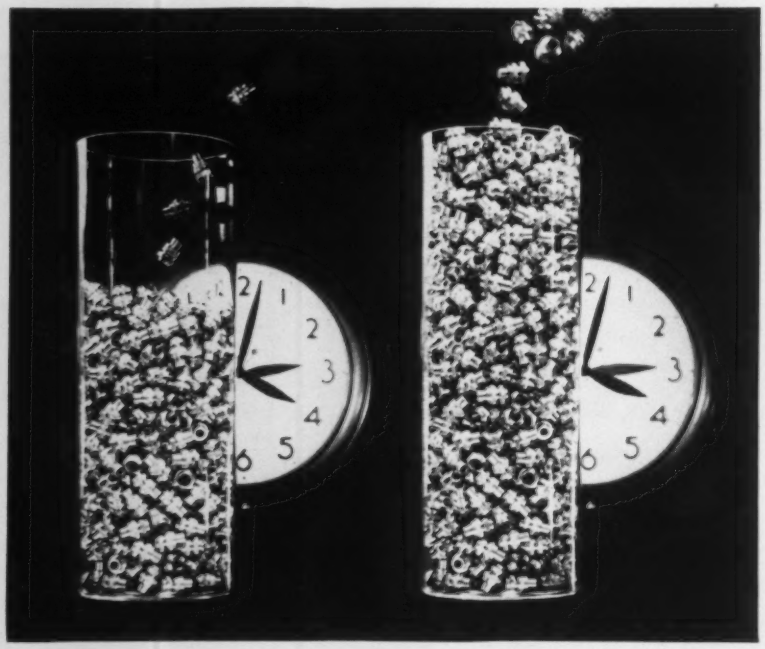
New, high-speed screw machines built to handle the steel will hit the market within thirty days, according to trade reports. This equipment will index in 1 second and is geared to operate at the high speeds usually obtained only with brass-cutting machines.

How About Price? — La Salle Steel suggests that the new material is marked at about a 75¢ per cwt —$15/ton—over leaded steel. Inland Steel indicates that for free-machining alloy steel, the price would be about $20/ton over leaded steel.

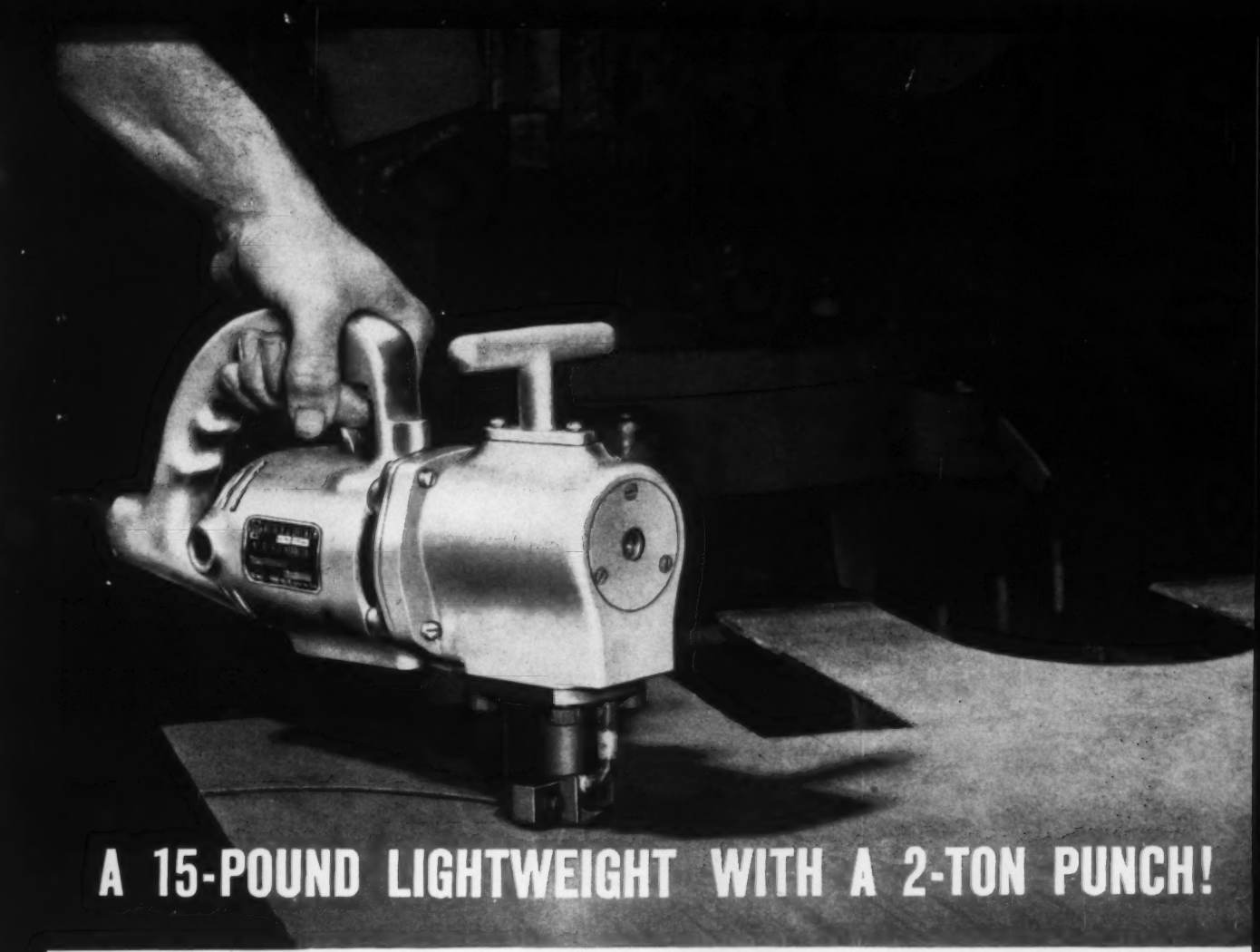
The premium for tellurium-bearing steels (Other vital elements are lead and sulphur.) would seem to offer little obstacle to their rapid adoption. In fact, it would suggest even faster gains than were made by Ledloy or La Salle's cold-drawn version, La-Led.

In that case, the 75¢ markup represented a 100 pct gain over the resulphurized steel extra. On a percentage basis, the markup on the new tellurium steel then shrinks to about a 30 pct-plus markup.

With the 20 shops in which La-Led X was tested reporting average machine speed gains of 30 pct, it would appear that the new steel could gain ground rapidly.



NEW BAR STOCK: In a one-hour comparison test, the new tellurium-bearing steel turned out one-third more parts than a conventional steel.



A 15-POUND LIGHTWEIGHT WITH A 2-TON PUNCH!

Introducing the new Black & Decker No. 8 H.D. Nibbler

Take big bites out of your heavy work, bring the tool to the job and slash cutting costs . . . with the all-new portable Black & Decker No. 8 Heavy-Duty Nibbler. Its 2-ton punching wallop cuts smoothly through 8-gauge plate, goes through heavy-gauge tubing and corrugated (most stainless, too) like a knife through butter . . . replaces torch cutting, eliminates edge grinding.

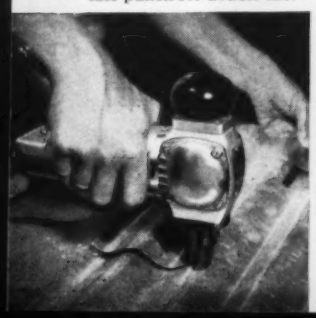
This new No. 8 Nibbler has more power with the greatest-ever load capacity . . . a unique built-in cutting-oil system, carbide dies for longest life. And its 15-pound weight, compactness and easy-grip T-handle assure perfect cutting control at all times.

There's a new and improved Black & Decker No. 16 Nibbler, too, for up to 16-gauge metals. See both new Nibblers now. They're sold by leading distributors everywhere. *For sales or service, look in the Yellow Pages of your telephone book under* TOOLS ELECTRIC

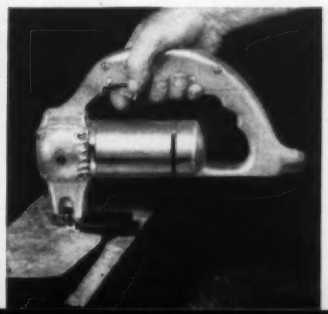
Black & Decker®

CUTS MAN-HOURS TO MINUTES

NEW No. 16 NIBBLER speeds through corrugated, straight or circle cuts with the greatest of ease. Won't bend or curl metal. Reversible punch for double life.



No. 16 SHEAR cuts easily through metal sheet . . . follows pattern lines perfectly. B&D also has No. 12 Shear for heavier metal, No. 18 for lighter work.



THE BLACK & DECKER MFG. CO., Dept. 0910
Towson 4, Maryland. (In Canada: Brockville, Ont.)

☐ Please arrange for a demonstration of .....

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Inventory Management Simulator program at...

Clark Equipment... improves customer

■ **High-capacity memory.** Two IBM 305 Data Processing Systems with RAMAC keep track of 75,000 replacement and repair parts in Clark's Chicago parts warehouse. ■ **The computer has the facts.** As soon as shipments arrive at the warehouse, an operator, using this remote inquiry station near the loading platform, finds out from the computers where various items go. ■ **Customer service first.** Using this remote inquiry station in the sales department, the operator gets information from the computer while the customer is on the phone.

Clark Equipment Company has prepared a computer program called an Inventory Management Simulator. The program allows Clark management to study the possible effects of decisions on future customer service and future warehouse profitability. When management gets the computer's report, it is in a position to make new rules for the operation of its parts warehouse.

Here's what's happened since Clark put the new program into operation:... improved customer service... practically eliminated back-order problem . . . reduced the putaway time for incoming material by more than 50 per cent . . . reduced emergency order shipping time by 50 per cent . . . enabled a physical inventory to be taken without any interruption of service to customers.

service...with less inventory

Availability highest ever. Inventory management is a complex job at Clark. Its Chicago warehouse is one of the busiest and largest in the country. Before the Simulator program was developed, the warehouse carried an inventory of 85,000 individual replacement and repair parts. Use of the program helped transfer the investment in inventory to those parts most frequently called for, giving high availability with less investment.

Management Operating System.* Clark installed two IBM 305 Data Processing Systems with RAMAC.® These computers store, update, and offer on an instant's notice information on almost every aspect of the warehouse operation including complete information on every one of the 75,000 items maintained in stock.

Now, Clark is assured of maintaining just the right level of stock for each item. The procurement formulas, developed from the Inventory Management Simulator, even recommend how large a purchase order should be placed for each item and where it should be placed.

If you have an inventory problem, why not consider a simulation program? You don't have to have your own computer. We can supply you with an Inventory Management Simulator...you can rent time on a computer. Result...improve the profitability of your warehouse operation.

**A Management Operating System uses IBM computers to make routine business decisions and take action automatically ...flags problems that need management's special attention... frees management to concentrate on the big problems and on long range planning. As a result, it gives tighter control of all business operations...and helps cut costs.*

IBM®
DATA PROCESSING

TIN
COATING
from .00002
to .0025
Somers
THIN STRIP
For the first time tin coated thin strip is available in solderable coatings up to .0025" thick.
Pure tin and tin-lead alloys are now coated on copper, brass, or nickel in all gauges from .002 to .012 in thicknesses of .00002 to .0025.
Over 50 years experience in the highly specialized field of thin strip makes Somers your #1 source for that one job in ten that must meet rigid specifications. Write for confidential data blank to get the exact thin strip for your requirements — no obligation, of course.
SOMERS BRASS COMPANY, INC. • 94 Baldwin Ave., Waterbury, Conn.

NEW PATENTS

Vacuum Process

Process of simultaneously producing manganese and ferrosilicon (assigned to Soc. d'Electro-Chimie d'Electro-Metallurgie des Acieries Electriques, d'Ugine, Paris, France), June 28, 1961. This method simultaneously produces ferrosilicon and manganese by vacuum distilling a mixture of iron, silicon and manganese under optimum conditions. In the process, the mixture exhibits a homogeneous liquid phase. British 871,395.

Reduction Process

Three - stage fluidized - reduction process, J. C. Agarwal (assigned to U. S. Steel Corp.), Aug. 15, 1961. An improved three-step, fluidized-bed, direct-reduction process for iron oxide depends on maintaining the percentage by which ferrous oxide is reduced in the second and third steps. This percentage is proportioned in a critical way that produces successful operation. Heat requirements in the last two steps are approximately equal. In the 1050°-1300°F range, the temperature is low enough to prevent sticking. U. S. 2,996,373.

Hearth Apparatus

Combined melting-hearth and gas-reformer apparatus, F. W. Luerssen (assigned to Inland Steel Co.), Aug. 8, 1961. An apparatus for melting reduced iron-oxide ores and for generating a carbon monoxide-rich gas consists of (1) a combined melting and gas-generating zone, (2) an upgrading or gas-reforming zone where the gas from the first zone is treated to increase its reducing capacity, and (3) a reduction zone where ore is reduced with reformed gas from the second zone. Reduced ore passes to the melting zone. Canadian 625,350.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Hard Surfacing

Sixty-four individual data-sheet pages comprise a catalog on a complete line of hard-surfacing electrodes and wires. Each sheet describes the product, its uses, typical properties of the deposited weld metal, welding methods and packaging techniques. (Alloy Rods Co.)

For free copy circle No. 1 on postcard

Small Tubing

Here's a completely-new catalog which sets forth sizes, specs, finishes, chemistry and suitable uses for a line of small diameter tubing. One complete section covers inspection procedures and quality control. Other sections discuss the various metals and alloys available. (J. Bishop & Co.)

For free copy circle No. 2 on postcard

Heaters and Dryers

Heater sections for air-conditioning preheat, fresh-air supply, and process and drying applications are described in a new 12-page bulletin. Illustrated with diagrams, photographs, and cutaway drawings, the literature covers principles of operation, typical uses, selection methods and specs. (L. J. Wing Mfg. Co.)

For free copy circle No. 3 on postcard

Miniature Gears

A new 256-page pocket-sized catalog details the broadest line of stock miniature gears available in the U. S. It includes complete specs for stock precision clamps, bearings, shafts, retaining rings, roll pins and related electromechanical specialties as well. (Perfect Gear and Instrument Corp.)

For free copy circle No. 4 on postcard

Equipment for Rent

Interested in planning your equipment - acquisition program over a period of up to 12 years? A new brochure gives all the details on a special leasing plan which allows extra-long terms. (Nationwide Leasing Co.)

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Cobalt as an Alloy

Reprints from the Cobalt Information Center's latest issue of "Cobalt" will soon be available to interested readers. These research reports stress the advantages offered by Cobalt as an alloying material.

For free copy circle No. 6 on postcard

Powder Metallurgy

Two new issues of the "Powder Metallurgy Quarterly," a publication of the Metal Powder Industries Federation, have just been released. Today, according to a quoted report, increased product reliability has become a prime asset of powder metallurgy.

For free copy circle No. 7 on postcard

Magnesium Digest

This bulletin provides a revised listing and a brief description of magnesium specifications issued by Government procurement agencies and technical societies. (The Dow Metal Products Co., a division of The Dow Chemical Co.)

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Turning Tools

Positive-rake angles up to 13°, with lapped inserts and chipbreakers are features of new

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 10/5/61

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FREE LITERATURE

Hi-Shear turning tools. A catalog supplement and tracing templates provide useful data on this development. (Valentine Metals)
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Product-Value Analysis

Automatic reordering of familiar old parts, like metal fasteners, may mean you're simply repeating an old error. At least that's the viewpoint taken in a hard-hitting booklet which urges regular reviews of fastener needs. (The H. M. Harper Co.)
For free copy circle No. 10 on postcard

Keyway Selection

A new brochure illustrates and describes a machine designed to cut various sizes and types of internal keyways. Also available is a wall card that aids selection of the right-size keyway for various jobs. (Davis Keyseater Co.)
For free copy circle No. 11 on postcard

Tubing for Condensers

A new 12-page booklet gives detailed information on the use of stainless-steel tubing in condensers. Historical background, performance data, applications, tube fabrication and other data are backed up by charts and photographs. (Allegheny Ludlum Steel Corp.)
For free copy circle No. 12 on postcard

Wire-Rope Conveyors

Wire-rope conveyors, above and below the ground, are the subject of a new systems bulletin. Included in the publication are basic types of head sections, power units, wire-rope supports, belt takeups and auxiliary equipment. (Hewitt-Robins)
For free copy circle No. 13 on postcard

Air-Conditioning Guide

An air-conditioning guide fits in the pocket for easy reference. Data are imprinted on both sides of a 3½ x 6½-in., plastic-enclosed card. All designers, consulting engineers and architects should find this item of value. (Carrier Corp.)
For free copy circle No. 14 on postcard

Brazing Chart

A new brazing-alloy reference chart lists metal compositions, density, and melt and flow temperatures for a line of silver and precious-metal alloys. In all, the chart details 56 different compositions. (Engelhard Industries, Inc.)
For free copy circle No. 15 on postcard

Vacuum Metallizing

Comprehensive treatment of the vacuum - metallizing technique is available in colorful new brochure. Current applications are illustrated; and suggestions on lacquering and filament arrangements are also included. (F. J. Stokes Corp.)
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Packaged Power

Motorized hydraulic-power units are described in a new four-page bulletin. These packages contain pump, electric motor, valve and reservoir in one compact unit. (Vickers Inc., a division of Sperry Rand Corp.)
For free copy circle No. 17 on postcard

Copper Cladding

The Spaulding Fibre Co. has just released a new brochure describing the grades, production technique and quality control of its copper-clad materials. The four-color folder lists complete characteristics of all grades. (Spaulding Fibre Co., Inc.)
For free copy circle No. 18 on postcard

Infrared Heating

Fostoria Corp. offers a new eight-page, two-color brochure explaining the principle of radiant heat. It describes Forstoria's equipment for utilizating the electric-infrared radiant-heating processes. It also pictures some of the many and varied industrial uses for these units.
For free copy circle No. 19 on postcard

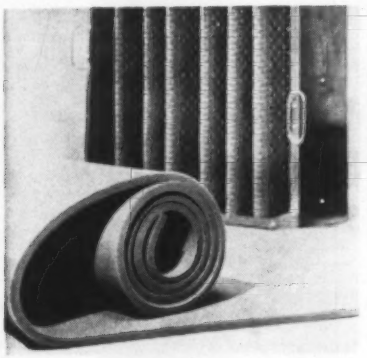
Materials Handling

This new catalog contains complete information on a line of portable and adjustable conveyors, hinged-steel belt conveyors, and custom conveyors from off-the-shelf components. (May-Fran Mfg. Co.)
For free copy circle No. 20 on postcard

Two Milling Catalogs

An expanded line of milling cutters is thoroughly covered in two new catalogs hot off the press. Detail drawings and charts provide data on each cutter series, including sizes available, complete product specs and ordering information. (Vascoloy-Ramet Corp.)
For free copy circle No. 21 on postcard

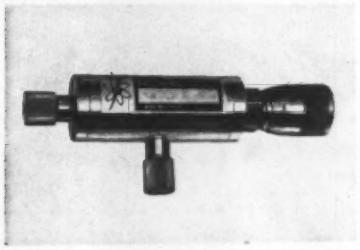
New Materials and Components



Polyurethane Foam Upgrades Filter Performance

This structurally-different polyurethane foam is both permanent and washable. With a life expectancy of 15 years, it's a premium airfilter medium in central-ventilating installations. Dust-holding capacity is exceptional, even when the air flow is high. Permanent filters using the foam medium are washable and immediately reusable without oiling or other treatment. This makes them ideally suited to establishments with limited maintenance personnel. The foam's properties result from its three-dimensional structure, in which open pores are created by the linkage of interconnecting strands. These open pores provide cellular pockets for depth loading of airborne particles. (Scott Paper Co., Foam Div.)

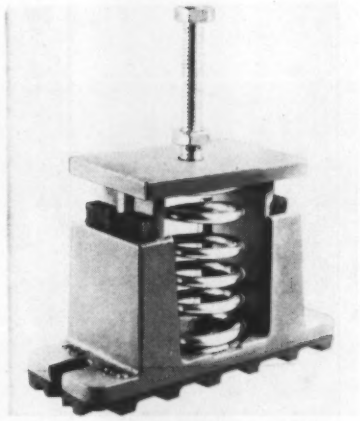
For more data circle No. 22 on postcard, p. 87



Precision Valve Adjusts Vacuum-Vessel Pressure

Completely redesigned and new in concept, a precision-metering valve adjusts pressures in vacuum vessels from a low of 10 mm Hg to 1 atm. One exclusive feature is its non-rotating, linear, microgroove stem, which insures complete control of the leak rate. This stem is housed in a bellows-sealed assembly. Another bonus is fine adjustment. Flow rates can vary from about 0.01-5 cc per second. (Vactronic Laboratory Equipment, Inc.)

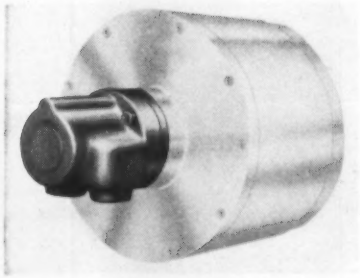
For more data circle No. 23 on postcard, p. 87



Low-Cost Mount Bolsters Machine Efficiency

Here's a low-cost spring isolation mount that cuts equipment-installation time in half. At the same time, the compact mount maintains equipment efficiency, and stops vibration, shock and structural noise. Its isolating mechanism employs a single helical coil-steel spring as the "cushioning" medium. These units are available in load-carrying capacities ranging from 50-540 lb. This wide range results from a selection of four different springs which can be inserted into the isolator housing. Access ports on each side of the cast housing permit interior inspection and easy cleaning. They also enable the spring to be changed in the field without dismantling the installation. Unusual economy results since you can quickly insert a stiffer spring into the housing when heavy accessories are added. (The Korfund Co., Shock & Vibration Div.)

For more data circle No. 24 on postcard, p. 87



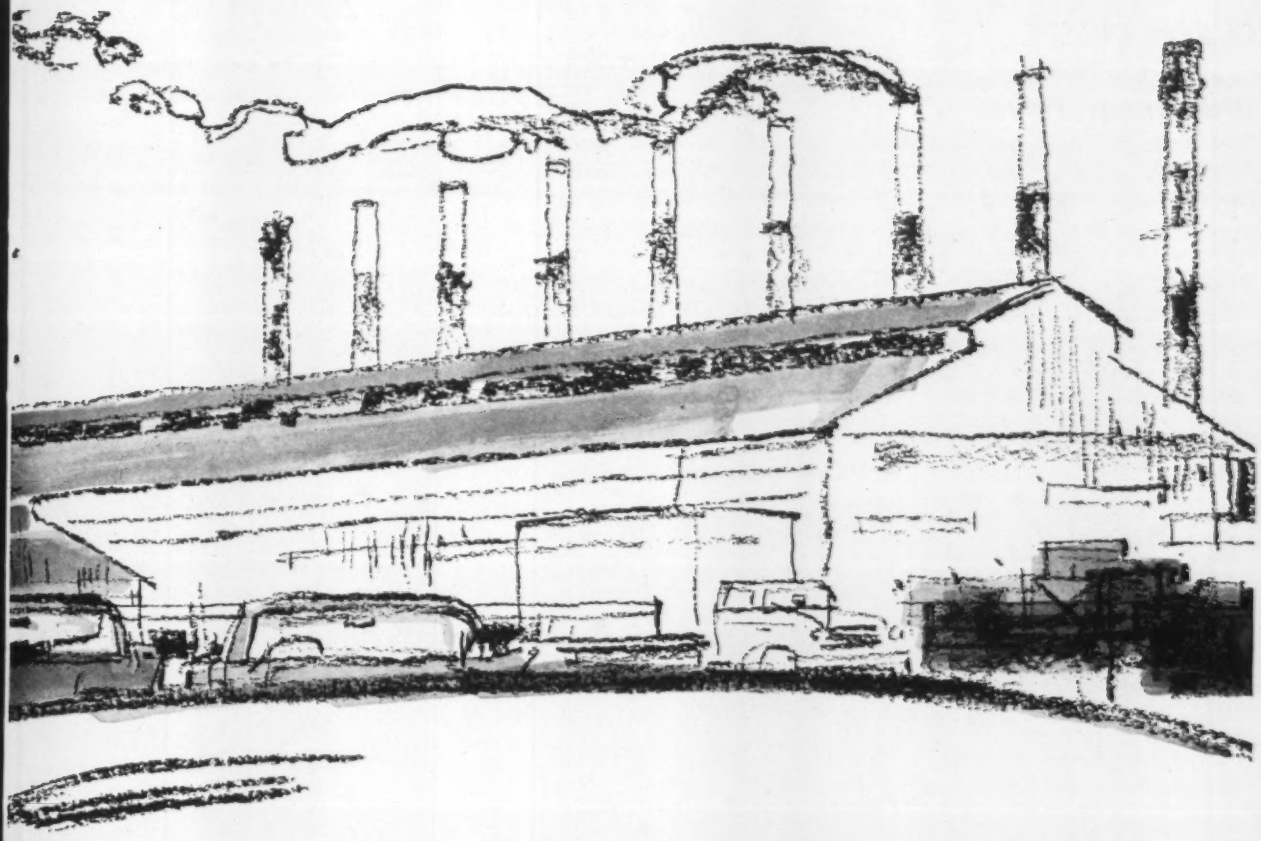
New Air Inlets Raise Machine-Tool Spindle Speeds

Spindle speeds up to 4000 rpm on modern metalworking machines are now possible with this new double-bearing air inlet. It's simple design reduces upkeep and promotes long dependable service. There's also a special inlet seal that adjusts itself automatically through working pressure. Precision machining and close tolerances boost the unit's life expectancy and also enable it to perform at low operating temperatures. These air inlets come in 3-, 4½-, 6- and 8-in. bore sizes. (The S-P Mfg. Corp.)

For more data circle No. 25 on postcard, p. 87

"Foote says Electromanganese will reduce our breakage claims . . . and lower our processing costs at the same time!"

"I don't believe it, but let's let them prove it!"



We'd welcome the chance! Because we've seen it work for so many other steel producers. They've found that Foote Electromanganese®, 99.9% pure electrolytic manganese metal, improves ductility . . . provides finer deep-drawing qualities for *their* customers, cuts down claims and rejects.

As for lower processing costs, these same producers have slightly higher ingot costs, in some cases, but realize savings in less furnace time, less annealing time, less rolling time.

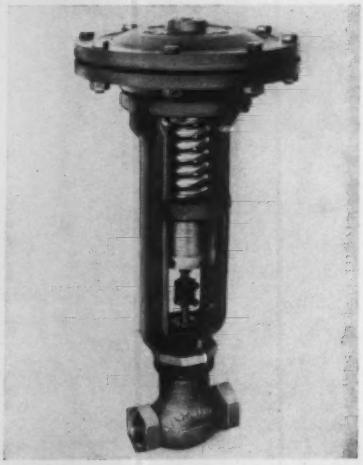
Of course, the reason behind these savings is the fact that you start with fewer impurities in the ingot. Electromanganese gives you true *pin-point control* of carbon, silicon and phosphorus—enabling you to begin and end with a superior product, and greater customer satisfaction.

Let us prove it to you! Foote metallurgists will survey your problems and processing procedures, then recommend a positive solution. If you have specific quality problems in aluminum-killed, rimming, free-machining or stainless steels, now is the perfect time to test this economical solution. Write for full information, and ask for your copy of Bulletin 201, which tells all the advantages of Foote Electromanganese. Foote Mineral Company, 438-18 West Chelten Ave., Philadelphia 44, Pa.

FOOTE
MINERAL COMPANY

Diaphragm Valves

New single-seat pressure-reducing diaphragm valves features "O"-ring construction. This design elim-

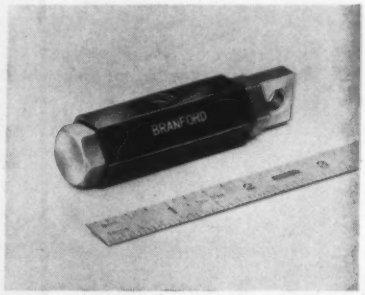


inates stuffing boxes. As a result, upkeep is held to a bare minimum. Bronze-body valves of this series are designed for working pressures to 300 psi at temperatures up to 500°F. Steel-body valves are available for 600-psi working pressure. Both units are recommended for steam, fuel oil, water, gas or air where tight sealing is required. In application, the valves can be used as simple governors for controlling delivery pressure of turbine-driven or direct-acting pumps. They're also good with any type of pilot or three-way hand control. They excel on small pumps which require tight-closing governors to control discharge pressure on minimum loads. (Atlas Valve Co.)

For more data circle No. 26 on postcard, p. 87

Midget Vibrator

Newly-available are midget pneumatic vibrators with a reciprocating piston. Operating on 10-80 psi line pressures, the units yield a frequency range between 6000-18,000 vibrations per minute. Recommended operating range is 10-20 psi for a low noise level. The units will have applications where size or weight is a factor, where high frequency is an asset, when low-air consumption is an advantage, where magnetism from electric vibrators cannot be



tolerated, or when a very-low noise level is desired. A dustproof model is also offered. This vibrator is springless and has plugless air passages. Standard models are available from stock with a single-attaching head. Other types of attachments will be built to meet special requirements. (The Branford Co.)

For more data circle No. 27 on postcard, p. 87

Epoxy Paste in Tubes

Packaged in tubes, a fast-curing, epoxy-paste material has carvability, dimensional stability and easy workability. It is widely used as a quick, effective method for building and duplicating male and female parts; or, as a repair or rebuilding material. The new tube containers stop waste and facilitate use where small amounts are needed. They're ideal for use on the model or pattern maker's workbench. No weighing is necessary. Ribbons of resin and hardener are squeezed out, mixed and applied. Small quantities mix quickly, and there is no chance for error in the resin-hardened ratio. (REN Plastics, Inc.)

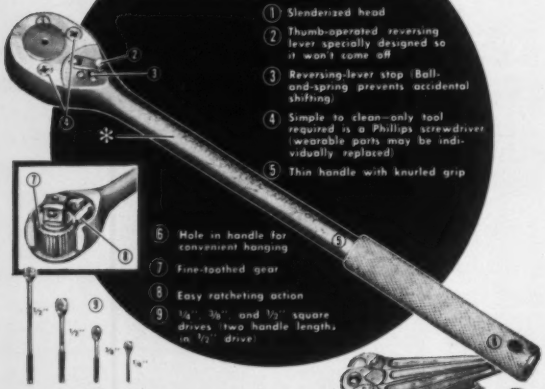
For more data circle No. 28 on postcard, p. 87

Automatic Timers

Here's a new series of automatic reset timers designed to delay an operation or to operate a circuit for a preset time after remote-pilot action. Continuous-running sychronous motors assure timing accuracy and simplify circuitry by doing away with a motor shutoff switch. Also, units in the series can be externally wired for use with various pilot

New ARMSTRONG Series "90" Ratchet

The ONLY Ratchet with ALL these important features!


1 Slenderized head
2 Thumb-operated reversing lever specially designed so it won't come off
3 Reversing-lever stop (Ball-and-spring prevents accidental shifting)
4 Simple to clean—only tool required is a Phillips screwdriver (wearable parts may be individually replaced)
5 Thin handle with knurled grip
6 Hole in handle for convenient hanging
7 Fine-toothed gear
8 Easy ratcheting action
9 ¼", ⅜" and ½" square drives (two handle lengths in ½" drive)

All wearable parts are replaceable; individually, inexpensively, easily. With no teeth cut into handle, it need never be replaced. "ARMSTRONG" on these ratchets guarantees: advance design, top quality and tool sense. Extra heavy duty "50" Series ARMSTRONG ratchets (see right) in 1", ¾", ½" and ⅜" square drive sizes. Our General Catalog 700 gives complete information on these and approximately 5500 other ARMSTRONG TOOLS. Your local ARMSTRONG Distributors will supply you a Catalog and demonstrate the new ratchets. If you don't know who he is, write us for his name.

ARMSTRONG BROS. TOOL CO.

5209 W. Armstrong Ave. • Chicago 46, Illinois

STEELMAKING AT JESSOP

Survival? It could depend on a 3,000-mile picket fence

Ever-vigilant sentinels against surprise attack are the radar installations along the DEW Line. Stretching 3,000 miles across Canada and Alaska, this electronic fence is our first line of defense.

At bleak, lonely outposts Air Force and civilian technicians watch for tell-tale blips on radarscopes—Distant Early Warning of the possible approach of enemy aircraft or missiles.

This all-weather system must withstand the worst of the elements—sub-zero temperatures, high velocity winds, rain, snow and ice storms common to the Far North. And dependability of the equipment could determine whether or not we survive an attack.

There are numerous applications for specialty steels made by Jessop Steel Company in DEW Line installations. For example, forging quality alloys and wear-resistant tool steels for the gear mechanism of a rotating surveillance radar; cast-to-shape steel for certain other component parts and precision ground steels for delicate instrumentation.

Jessop is keenly aware of the importance of built-in dependability in the steelmaking process—whether meeting specifications for steel to be used in the nuclear reactor of a Polaris-firing submarine; a Redstone missile to launch an astronaut; an earth-girdling satellite; or a DEW Line radar installation.

Yes, for dependability, you can rely on Jessop . . . the *big* name in specialty steel.

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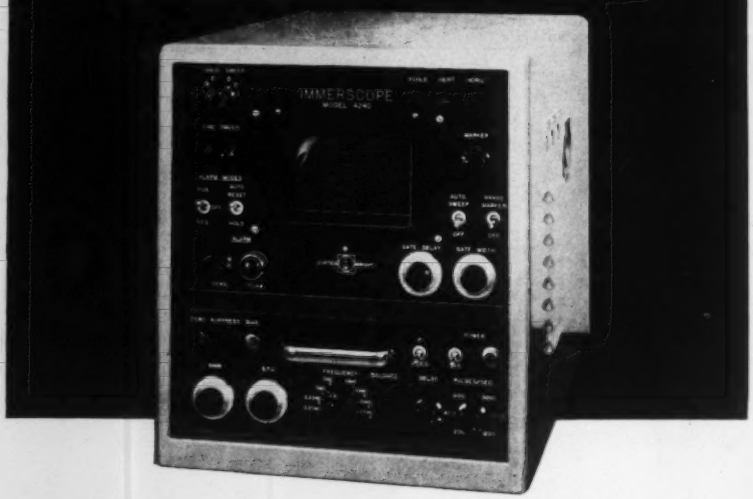
JESSOP

NOW! Even Greater Capabilities

Curtiss-Wright NEW Model 424-D

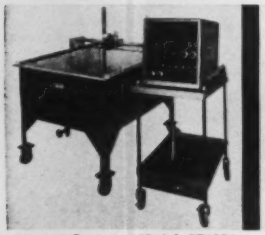
IMMERSCOPE®

ULTRASONIC **FLAW DETECTOR**

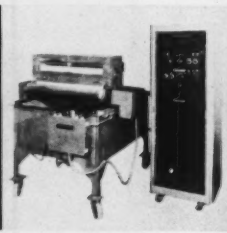


New Features — Outstanding Flexibility

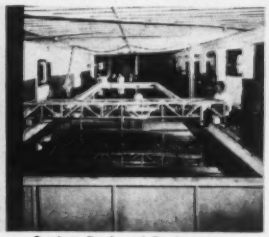
A-Scan Presentation—Unidirectional pip on 7" cathode ray tube
Multi-Technique—Immersed or contact testing, using either single or dual transducer
Exceptional Sensitivity—Full amplitude response to 1/64" diameter defect at 5, 10 and 15 MC for immersed — 5 MC for contact testing
High Resolution—Detects 3/64" dia. defect 0.125" below surface at 10 MC for immersed — 0.040" below surface at 2.25, 5 and 10 MC for contact testing
Dynamic Range—50 to 1 in IF mode, 20 to 1 in Video
Hi-Low Voltage Switching—Enables use of titanate or zirconate transducers
Variable Pulse Repetition Rate—200 pps steps, from 200 to 1200 pps
Video or IF Modes—Choice of maximum sensitivity and resolution or maximum dynamic range
High-Speed Flaw Alarm—Insures positive warning even at highest scanning speeds. Relay provided for controlling external circuits
Sensitivity Time Control—Compensates for attenuation with depth
Noise Suppression—Clips noise and extraneous signals below a controllable amplitude level
Recorder Output Circuit—Provides signal for actuating Electrosensitive Recorder
One Microsecond Video Delay—Enables flaw alarm gate to be positioned closer to video signal
More Precise Control Settings—Additional precision potentiometers simplify setup and adjustment



Manual Package—Model PT1001
Manually operated bridge and scanner, precision manipulator, Immerscope, search tubes, transducers and standard size tank (4' long x 3' wide x 18 in. deep).



Automated Package—Model 503
Electrically driven for pre-programmed scanning. Electrosensitive Recorder, Immerscope, search tubes, transducers and standard tank.



Custom-Designed Packages
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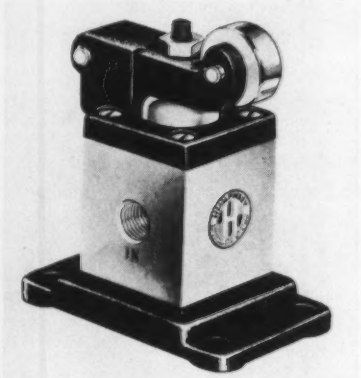
switches. Float switches, pressure switches, pushbutton, limit switches, relay contacts or any conventional

power switches are suitable for piloting the timers. (Paragon Electric Co., Inc.)

For more data circle No. 29 on postcard, p. 87

Versatile Valves

A new line of ½-in. valves provides fast actuation when and where you want it. The square body permits the actuator arm to be mounted in any one of four 90° positions. Bases of tough Tenzaloy come in two styles—bottom mounting and side mounting—to hold valve bodies perpendicular of parallel to mount-



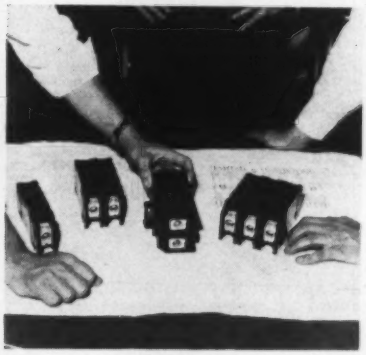
ing surfaces. Seven models are offered for either two- or three-way operation. Manually-operated valves are supplied with vertical-lever, push-button, palm-button, or fingertip actuators; mechanically-operated models with cycling speeds up to 30,000 per hour are equipped with ball-bearing or roller-arm cam. For rugged dependability in heavy-duty

service, actuator arms are also cast of self-hardening Tenzaloy. (Humphrey Products Div., General Gas Light Co.)

For more data circle No. 30 on postcard, p. 87

Breaks the Circuit

Molded-case circuit breakers for industrial uses are now available with a top rating of 200 amp. All units are 7-in. high and 2-11/16 in. deep. The single pole form is only 1½-in. wide; two-pole units are 3-in. wide; and the three-pole form is 4½-in. wide. These breakers are designed for circuit protection on industrial low-voltage distribution systems. They're especially useful for service-entrance application. They're also recommended for use



in individual enclosures, metering panels, load centers and mains in lighting panelboards. (Westinghouse Electric Corp.)

For more data circle No. 31 on postcard, p. 87

Cathode-Ray Tubes

Fiber-optics cathode-ray tubes print recording directly from the tube face without using conventional lenses. This method gives speeds up to 50-times faster than those possible with lens systems. It's expected that these tubes will be essential components for high-speed data-printing devices, and for computers. With the newcomers on the job, it's possible to produce characters and pictures through use of line-scan techniques or by step printing a long, narrow area. The tube face plate is based on the newly-developed principles of fiber optics. Light and images are transferred from the inside of the tube by means of hair-

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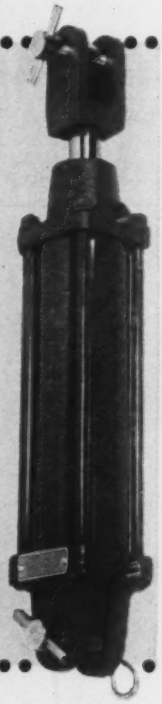
Roberts now carries special stocks of seamless and drawn-welded tubes—produced to O.D. and I.D. tolerances—suitable for honing, or completely finish-honed!



Yes, now you can select *from stock* the exact tube you need for your cylinder barrels, whether they are designed to above nominal or nominal I.D. dimensions. No more guess work on I.D. cleanup—often a problem with conventional tubes drawn to O.D. and Wall.

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DESIGN DIGEST

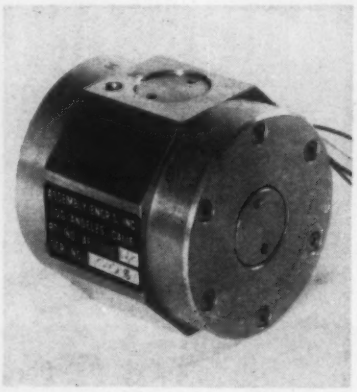
like strands of glass fibers. These fibers are clad and fused to form a

vacuum-tight and distortion-free plate. (American Optical Co.)

For more data circle No. 32 on postcard, p. 87

Dual-Pressure Switch

Separately actuated as two switches in one, this special dual switch acts as two single-pole units, or one couple-throw normally-closed unit. It's actuation pressure range is 1.0-10.0 in Hg, with a calibration accuracy of ±0.05 in. Hg. Contracts are rated at 3 amp; inductive load at 28-v dc. Maximum inrush of 15 amp can be tolerated. Life of the dual switch is 100,000

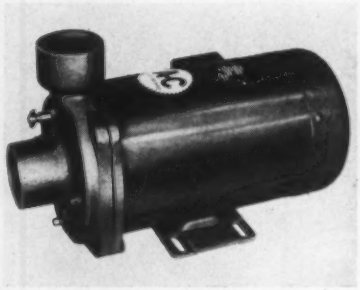


cycles applied at the rate of ½ cycle per second. Switches operate to specification in a temperature range from −65° to 165°F. (Assembly Engineers, Inc.)

For more data circle No. 33 on postcard, p. 87

Low-Cost Pumping

This single-stage suction pump handles non-corrosive liquids at temperatures up to 180°F. Compact construction and lower weight result from mounting pump parts to the motor, and by using the motor end housing as the pump stuffing-box cover. Units can be installed horizontally or vertically by bolting motor feet to any support of suitable strength. Casings have centerline discharge, are self-venting, and rotate to any of four positions 90° apart. Motors are standard NEMA fractional horsepower units with large deep-grooved shielded ball-bearings. Horsepower ratings range from ⅓ through 1 hp in both single and three-phase construction at



3450 rpm. Dynamic balancing holds noise and vibration to a minimum. (Allis-Chalmers Mfg. Co.)

For more data circle No. 34 on postcard, p. 87

Pump Motor

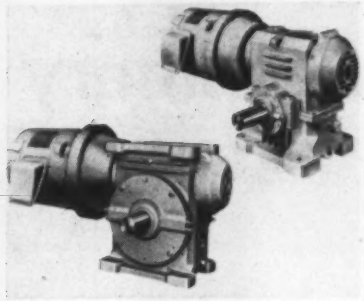
Vertical hollowshaft motors have wide application wherever water is to be lifted, distributed or circulated with centrifugal pumps. Typical applications include: Circulating anodizing tanks, spray booths, and emergency inplant water systems. Wide usage is also found in agriculture and municipal-water installations. Special weather protection is provided by the units, since installations are often exposed. All windings are impregnated with a special varnish; then permanently cemented into a single solid mass by a special double-immersion and baking process. Extra heavy-duty insulation on all slot cells, end connections and flexible leads provides maximum dielectric strength. (Reuland Electric Co.)

For more data circle No. 35 on postcard, p. 87

Turns The Corner

Units in a new line of right-angle gear motors with single-reduction worm gearing are suitable for use with apparatus driven by belts,

chains or spur gearing, as well as through couplings. These motors come in both ac- and dc-integral

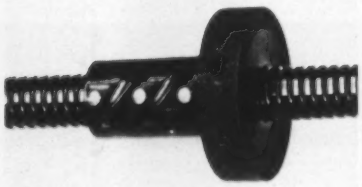


types. The single-reduction worm gearing offers high-ratio reduction with few moving parts in a close-coupled, compact drive. The right-angle drive arrangement takes up minimum space, without sacrificing dependability and performance. High thermal efficiency is achieved by an aluminum-radial fan which directs air over the finned sides of the gear housing. (Westinghouse Electric Corp.)

For more data circle No. 36 on postcard, p. 87

Steel/Nylon Washers

These steel and nylon washers limit the travel of ball-bearing screw assemblies. They provide a low-cost reliable method with freewheeling action. With the new design, a set of three washers, two steel and one nylon, replace conventional stop pins at each end of the desired nut travel. In addition to being inex-



pensive, the strong washers eliminate any danger of breakage. Mechanical efficiencies range from 90-95 pct. There's also no tendency for the units to creep under load. (Saginaw Steering Gear Div., General Motors Corp.)

For more data circle No. 37 on postcard, p. 87

ATLAS

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Atlas Transfer Cars are designed to meet individual production needs of each user, and built with workmanship that assures the ruggedness so necessary for safe, dependable service.

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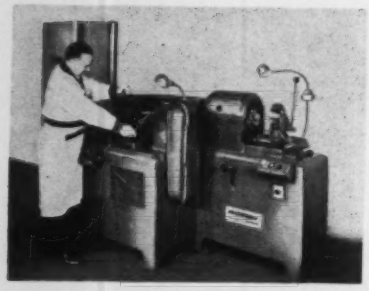
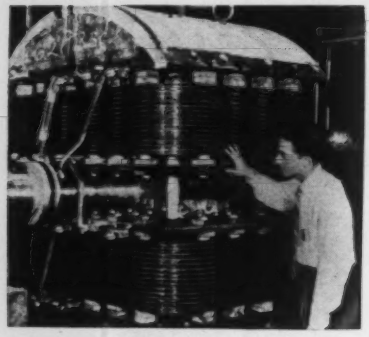
New Equipment and Machinery



Tube-Flaring Machine Aids Nation's Defense Effort

This unique machine was specially developed at the request of NASA to improve the quality of tube flaring in the Saturn Missile Program. It replaces and completely outperforms the old handtool flaring methods which were time consuming and seldom uniform. The machine handles standard tubes with ⅜-1½ in. OD and 0.028-0.049 in. walls. In a two-station operation, station one automatically trims and squares the tube ends. Station two handles flaring. (Progressive Welder & Machine Co.)

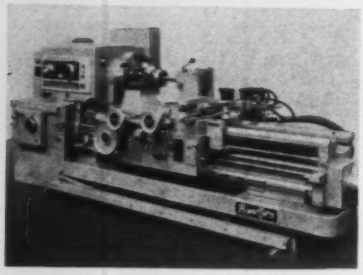
For more data circle No. 50 on postcard, p. 87



Magnetic Stirrers Boost Steel Production

An induction-stirring system for mixing molten steel in electric-arc furnaces passes magnetic fields through the melt to produce stirring action. Main use is with arc furnaces of 30-200 tons that turn out high-alloy, high-quality steel. Magnetic stirring imparts required uniformity in the melt, and reduces the length of time per heat. The practical result is increased production and better recovery of alloys introduced into the melt. In operation, a magnetic field sweeps through the molten bath and sets up eddy currents. These currents react with the stirrer's own field to move the steel. (Westinghouse Electric Corp.)

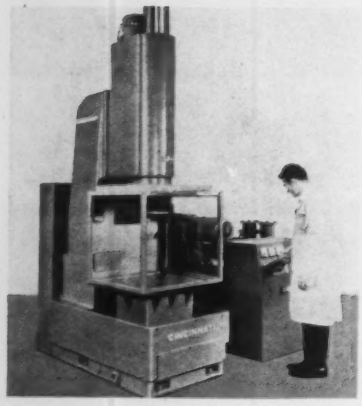
For more data circle No. 51 on postcard, p. 87



Dual-Slide Lathe Bores, Turns and Contour Faces

Here's a new dual-slide lathe that teams up accurate contour bor- with ordinary facing and turning operations. It handles this double role by means of dual tool slides mounted on a single carriage. Basically, the equipment is an engine lathe with two independently-controlled cross slides. One slide carries a four-way tool block for turning and facing cuts. The other tracer-controlled slide features a special boring-bar holder which pivots through the vertical plane. (The Lodge & Shipley Co.)

For more data circle No. 52 on postcard, p. 87



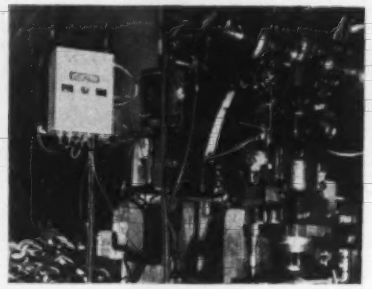
Electrochemical Machines Tackle Tough Alloys

Through an electrochemical process, this new type of equipment removes hard-to-machine metal at production rates. The tool imparts its shape to the metal being machined. Rapid chemical reactions result as an electric current passes through the electrolyte. These reactions account for all machining action. As a result, machined surfaces are free from burrs and stresses. A broad cross-section of metalworking companies, including those concerned with the aerospace programs, are finding this type of equipment invaluable in machining many difficult metals. Two models are currently available. One has an 8-in. quill traverse; while the other supplies a 22-in. quill travel. A solid table or moving-saddle table can be supplied for either. In addition, a special three-spindle machine is now under construction. (Cincinnati Milling Machine Co.)

For more data circle No. 53 on Postcard, p. 87

Guards Machinery

Completely-transistorized and low-in-cost, a new electronic control immediately stops a machine when any malfunction is detected. These pulse-logic monitoring devices continuously check and con-

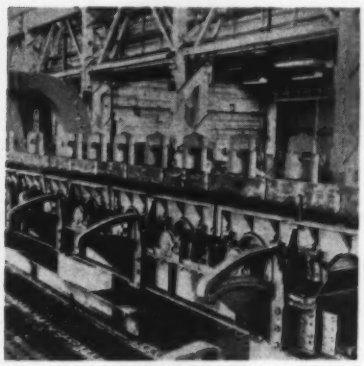


trol automatic machine operations. Construction is rugged, and there are no moving parts in operation. In addition, the units require little power. Fail-safe, dust-free circuitry, encapsulated in epoxy resin, provides maximum resistance to shock, moisture and other adverse environmental conditions. After extensive development and lengthy field trials, these monitors are now being offered to industry. (The Welditron Corp.)

For more data circle No. 54 on postcard, p. 87

Back-Shear Table

Here's good news for steel rolling-mill operators in the form of an advanced back-shear table for



the production of small to medium-sized structural bars. Already operational, the shear table cuts 60-ft lengths to an accuracy of 1/8 in. by means of a special vernier adjustment. This kind of precision eliminates the need for costly 2-3 in. excess allowances usually made to compensate for cutting inaccura-

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ARCOS STAINLESS OVERLAY CUTS COST

Job Report Courtesy of Pottstown Metal Products Works
Cochrane Div. of Crane Co., Pottstown, Pa.

Arcos stainless overlay cuts overall cost of chemical reactor 10%. The application of a stainless overlay to the face of a carbon steel flange, not available in clad material and too expensive in solid stainless, resulted in a 10% overall saving in the construction costs of an unusual epoxy resin reactor. The overlay was applied by automatic submerged arc, using Arcos Type 308 bare wire and Arcosite C7 flux. This is another example of the economy and performance you get with Arcos stainless filler metal products.

ARCOS

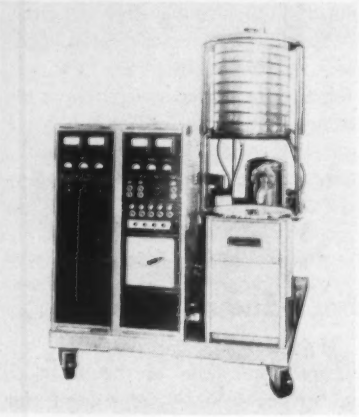
Arcos Corporation • 1500 S. 50th St. • Philadelphia 43, Pa.

cy. The back-shear table incorporates individual shaft-mounted gear motors on its 27 conveyor rolls. In addition, three massive shear gages minimize hammer effect. (Western Gear Corp., Industrial Products Div.)

For more data circle No. 55 on postcard, p. 87

High-Vacuum Furnace

The outstanding advantage of a new high-vacuum, induction-billet furnace lies in rapidly bringing a billet to forging temperatures with a minimum of oxide formation. This is particularly valuable with metals such as molybdenum, tungsten, vanadium rhenium, tantalum and columbium. The furnace itself



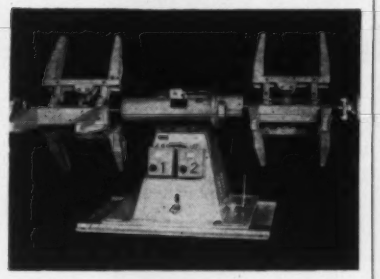
consists of a bell jar and work coil, together with a backing pump and high-vacuum blower. Bell jar and work coil mount on high-speed lifting mechanisms. This facilitates quick loading and removal of the work. Billets are placed in the chamber and brought to forging temperature by induction heating. Then the vacuum is broken by the introduction of an inert gas to prevent oxide build-up. Billets are then quickly removed for forging. (High Vacuum Equipment Corp.)

For more data circle No. 56 on postcard, p. 87

Double-Coil Reel

For high-production metal stamping, a new double-coil stock reel uncoils stock smoothly to stamping presses and other allied automatic-production equipment. This

double feature allows the off side to be loaded while the other side is in operation. The result is less downtime for switching coils, par-

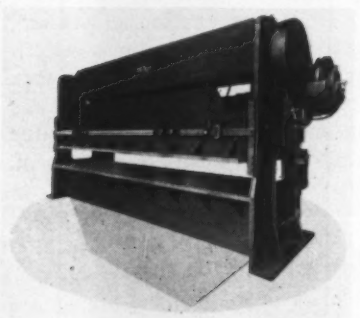


ticularly on long runs. In operation, a touch of the foot pedal releases the pedestal lock. This allows the reel head to swing into position with the new coil correctly aligned for immediate operation. In the operating position, each side automatically locks. Both reels feature individual electric-brake and rheostat controls to prevent stock over-run and to keep proper tension on the stock. (Cooper Weymouth Inc.)

For more data circle No. 57 on postcard, p. 87

Large Die Area

A new press brake of 150-ton capacity has a die area of 60 x 216 in. It's used for multiple punching, piercing and blanking operations on large steel sheets for showcase side panels. Instead of the conventional, single-plate bed and ram, this machine features a two-



plate, cross-ribbed box-type slide and a two-plate cross-ribbed bed. The press brake is available in capacities up to 500 tons.

For more data circle No. 58 on postcard, p. 87

Controls Machine Tools

This new unit offers a relatively low-cost means of controlling or

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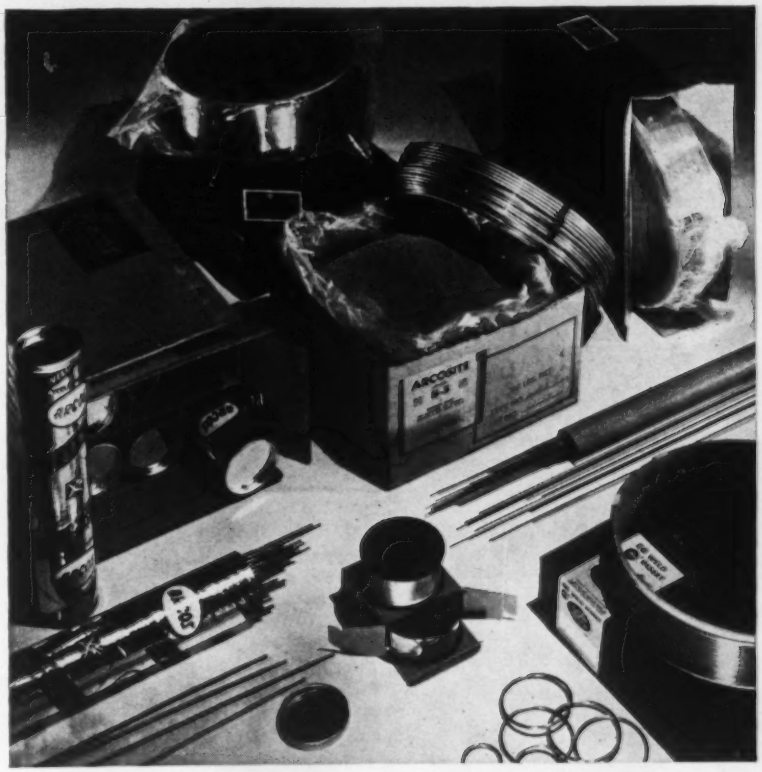

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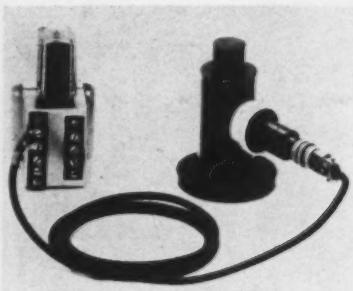
NEW EQUIPMENT

detecting compression and tension in a production setting. It's a force-load cell that's actuated by deflec-

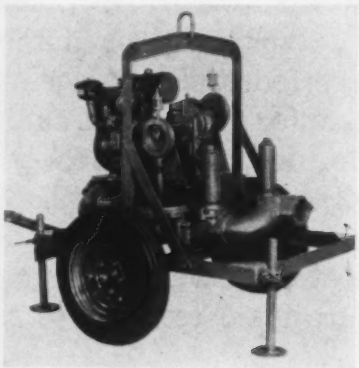


tions as small as 0.001-0.005 in. These minute deflections act on a special sensor unit, generating an electrical impulse. This signal triggers a plug-in relay controller. Available in 16 standard models, the unit comes in three series with capacities ranging from 500-1000 to 75,000-500,000 lb of force. However, the cells will sustain overloads up to four times their rated capacity. (Force Controls Co.)

For more data circle No. 59 on postcard, p. 87

Portable Pumps

A new line of gas-engine powered, diaphragm pumps includes both single- and double-diaphragm types in an over-all range of 14 model sizes. Capacities range from 1000-



17,000 gal per hour. Suction and discharge openings range from 2 in. single to 4 in. double. Both swing- and ball-type valves are offered in the new line. The pump's form-gear drive provides a one-step speed reduction. This feature does away with intermediate speed reductions on either the power source or the pump. Worm and worm gear operate in a constant bath of oil. (Rice Pump & Machine Co.)

For more data circle No. 60 on postcard, p. 87

Electronic Micrometer

Operator discrimination is completely eliminated with a new-model electronic micrometer. Measurements are displayed on a four-digit counter that reads to 20 millionths of an in. With this instrument, unskilled operators produce measurements with laboratory accuracy and precision. Regardless of who presses the switch, readings are always the same. In other words, the operator has no control over the measuring function. In fact, no gage

blocks are necessary within the measuring range of the instrument. It is its own reference standard, since the micrometer tip is zeroed-in against the optically-flat work surface. Thus, the new unit is not an optical comparator; it is a true screw-thread measuring instrument. (J. W. Dice Co.)

For more data circle No. 61 on postcard, p. 87

Small Torch

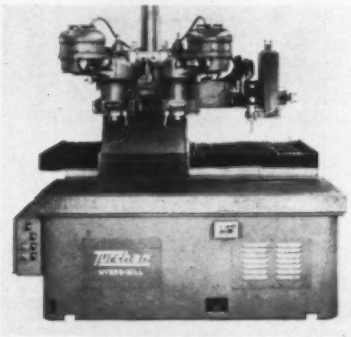
Many "big-torch" features are included in this featherweight welding torch with the shortest head of any TIG unit. Weighing only 2½ oz, this new item is specifically designed for welding complex aircraft parts. It's also ideal for hard-to-reach joints. An average head length of just 1 in. (depending on cup size) enables an operator to weld in areas with only 1¼-in.

clearance. This small size also gives him a better look at the weld puddle. (Linde Co., a division of Union Carbide Corp.)

For more data circle No. 62 on postcard, p. 87

Machines Large Parts

Capable of three-dimensional tracing on both spindles, a new

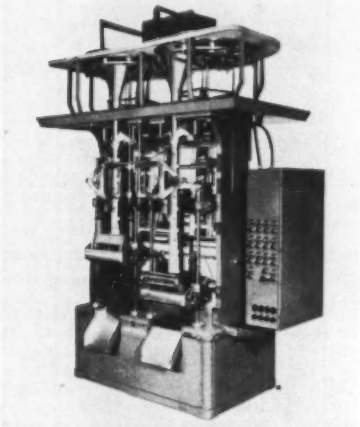


two-spindle automatic tracer mill accommodates parts and models up to 13 x 36 x 12 in. A special control unit permits combination profiling and contouring. This unit triggers actuators on the vertical slide, saddle and ram. Feed rates on all three dimensions are 0-40 in. per minute. Up to 5 hp motors are available for each spindle. (Turchan Follower Machine Co.)

For more data circle No. 63 on postcard, p. 87

Fast Packaging

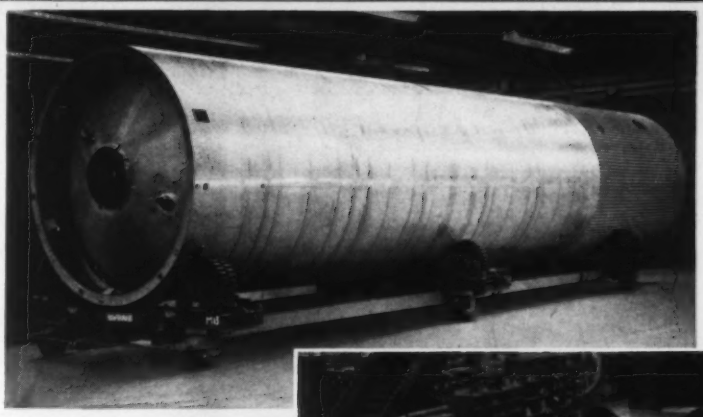
A new packaging machine handles a wide variety of products in



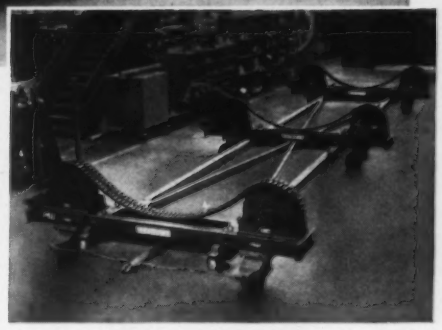
all types of heat-sealable papers, films and foils at speeds of up to 200 bags per minute. High-production rate of this double-tube machine results from a rocker-arm drive mechanism that uses the weight of one draw bar to counterbalance the other draw bar. Friction, overall weight and wear are reduced because the new "self-counterbalancing" construction eliminates the need for special balancing weights. The simplified drive mechanism uses no cams or springs and all shafts are ball-bearing mounted. For single tube operation of 100 bags per minute, the machine comes with only one draw bar and tube-forming mechanism. Basic main frame and drive mechanism, however, remain the same as that used for double-tube operation. As a result, production rate of the single-tube machine can be quickly, easily and economically doubled at any time. Increasing the production of a single-tube unit can save as much as 60 pct of the cost of a new machine. (Hayssen Mfg., Co.)

For more data circle No. 64 on postcard, p. 87

PROFITS are built on DEPENDABILITY



For Steady, Positive, Precision Rotation of THIN-WALLED VESSELS use Aronson TRACTRED® TURNING ROLLS



Shown in the photographs above is a good example of an adaptation of Aronson TRACTRED Turning Rolls. Installed on a specially built dollie they become a portable unit that protects thin walled vessels from wrinkling, marring or indenting while being rotated or transported. Cradled in these rubber TRACTREDS, vessels are handled gently dependably with positive, precision rotation. Profits are built on dependability and dependability is built into every Aronson product.

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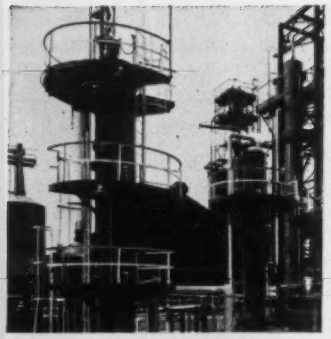
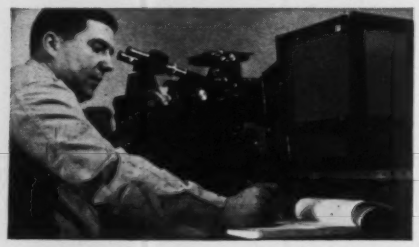
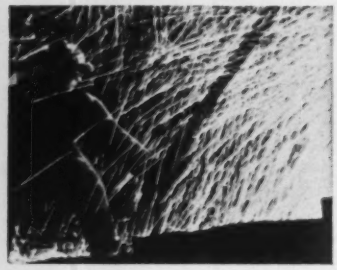




Thirty-six million dollars in new facilities . . .



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Market Poised on a Plateau

Failure of automakers to come into the market as strongly as hoped has slowed the advance.

Although some momentum has gone out of the market, general business continues good.

■ The steel market has reached a plateau and only moderate improvement is expected in the next few weeks.

Automakers have not come in with hoped-for increases in October-November tonnages. And without the expected surge of steel orders for new cars, the uptrend in steel lacks momentum for a major rise at this time.

Good Reasons — However, there are reasons for the apparent lack of big orders from Detroit. The industry has been beset by labor problems and labor uncertainty continues. Until the new model runs are assured of uninterrupted production, automakers are justified in cautious production scheduling and steel ordering.

Nevertheless, the failure of bigger orders to materialize from Detroit is disappointing to the steel industry. It was learned this week that one of the biggest auto divisions has tentatively scheduled 10 pct fewer cars for November than October, and 8.5 pct fewer cars for December than November. But this could change over night. It all depends on how the new models sell. An enthusiastic reception with good sales would result in immediate revision of production plans.

Strike Problems — The recent General Motors strike resulted in excess tonnage piled up at the steel mills and on rail cars. As a result, GM apparently had no need to revise its steel needs upward after the strike in spite of ambitious plans to get production rolling. Ford and Chrysler faced labor uncertainties and could not plan too far ahead for their steel needs.

The result is that while automakers are taking and ordering large tonnages of steel, advance orders have just not come up to expectations and mills have had to adopt a wait-and-see attitude.

Positive Signs—While the market has not picked up the momentum expected for October, it continues to advance slowly along a broad base. And there are these positive signs:

User inventories are still low. There is little evidence of any build-up except by a few farsighted buyers who see a prospect of lengthening lead times.

Although mills generally say business is not picking up as expected, a growing number of users complain about not getting delivery as promised. One major mill has had trouble making plate deliveries in the Midwest, for example.

General business continues to pick up. Defense orders are starting to show up here and there, although not yet a major factor in the pickup.

Steel production, now rolling along at about 74 percent of capacity, is expected to hold there and advance slightly in the weeks ahead. Operations throughout the fourth quarter should hold at round 75 percent. If auto orders pick up, there still could be a brisk advance.

District Steel Production Indexes
1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	113	118	114	96
Buffalo	103	99	96	62
Pittsburgh	107	106	101	70
Youngstown	100	100	92	79
Cleveland	148	142	123	100
Detroit	147	148	132	98
Chicago	114	116	108	88
Cincinnati	129	124	119	87
St. Louis	114	89	119	100
Southern	108	101	111	75
Western	115	114	118	85
U. S. Index	114.4	113.5	109.0	83.6

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	2,131	2,114	70,449	79,801
Ingot Index				
(1957-59=100)	114.4	113.5	97.0	109.8
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$39.17	$39.50	$39.17	$29.83
No. 2 bundles	$26.17	$26.83	$25.83	$20.17

Who Gets The Order—And Why?

Pittsburgh buyers' meeting gets down to harsh realities of reciprocity, price trading and supplier loyalty.

"Two-way street" is stressed in buyer-vendor dealings.

■ Purchasing agents got down to the facts of life in a recent Pittsburgh meeting.

Reciprocity, price trading and supplier loyalty were among the touchy subjects discussed at the District Six conference of the National Assn. of Purchasing Agents.

Workshop sessions also dealt with broad new concepts of organization and operation. There were descriptions of electronic systems and control techniques. However, the real action came when buyers dug into the harsh realities of who gets the order and why.

Vendor Performance — Comments made it clear there is no room in the present picture for slack supplier performance. Past records, reciprocal buying and technical contributions must be considered, said buyers. But a supplier can't expect orders because of these if he is not matching prices and values of competitors.

"We favor the customer who favors us but we don't expect to pay a premium," said S. E. Lauer, Jr., manager of purchases and traffic for the Sharon plant of Westinghouse Electric Corp.

Similar views were offered on the matter of technical contributions. Buyers said they would "preserve the position" of the company that pioneered important developments. But no one said the research-minded company was entitled automatically to premium prices.

The question of past performance is a little more complicated, buyers feel. A purchasing agent must develop long range assurance of supply, said W. L. Baker, Universal Manufacturing Co. purchasing agent. Buying policies should take into account reliabilty in times of shortage and times of surplus.

MOFFITT: Who gets the order?

Price Game—But what do you do when a new supplier comes in with a reduced price? This question was asked by R. C. Moffitt, vice president, purchases, United States Steel Corp. It produced a variety of answers.

You must make sure the new company is not just buying its way into the market, said Mr. Lauer. He feels a general knowledge of prices may be helpful in spotting a bid that is just a come-on.

Some buyers felt the loyal old supplier should be given a chance to become competitive. If this involves process changes, a certain amount of delay might be tolerated. However, buyers were less inclined to be patient with the company whose higher price reflected sluggish reactions to new developments.

Facts Rule—Ultimately, the buying decision must be based on performance, say purchasing men. And performance must be judged on a cold, factual basis, without bias or vagueness.

The question of price evaluation need not stop with a check of competitive offers. The Westinghouse Sharon plant uses general price indexes as one means of measuring value. Recently, it found that a 20 pct increase in transformer oil did not seem to be backed by changes in prices of crude oil and other elements in the product. These facts were brought to the attention of suppliers and a reduction was put through for transformer oil.

Cost information of this type has been used to negotiate reductions, even where there was only one supplier of a product.

"Sell in Reverse"—At the Pittsburgh meeting, buyers took a hard line on value but there was no feeling this was a time to sit back and let suppliers fight for your favor. The purchasing agent must practice "selling in reverse," said Mr. Baker. He said the buyer must meet the salesman at least halfway; he must actively seek new ideas.

Two-Way Street — Another aspect of the two-way street was mentioned by Mr. Lauer. For a large company like Westinghouse "every supplier salesman is a customer or potential customer."

This relationship calls for careful handling. Mr. Lauer said a trade relations policy must be consistent. You get "chaos if you change with each new development." Policy should be set at headquarters.

It was also pointed out that a purchaser must be careful about playing one supplier against another.

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Thin Tinplate Made More Versatile

Tinplate mills are improving a new product—offering thin tinplate in a full range of conventional coatings.

Differential coating also introduced, providing thin tinplate with light coat on one side, heavier on the other.

■ Steel mills are moving quickly to diversify and improve a new product—thin tinplate.

At least two mills, National Steel Corp. and Wheeling Steel Corp., are now offering the product just introduced last year in a full range of coatings. Previously only two light coatings were offered by mills.

Among the ranges offered by National are differential coatings, where a light weight coating is used on one side and a heavier weight coating on the other.

Coatings Listed — Products are supplied in the base weights of 45-pound, 50-pound, 55-pound, and 60-pound, previously used for the .10 lb and .25 lb per base box forms. The new coatings include: .50/.25; .50; .75/.25; .75; 1.00/.25; 1.00/.50; 1.00; 1.35/.25.

Other producers of thin tinplate —including U. S. Steel, Bethlehem, Inland Steel, Jones & Laughlin, and Youngstown Sheet & Tube—have, as yet, not acted.

Coat Before or After?—The National announcement focuses attention on alternate ways to make thin tinplate—full reduction before coating or reduction after coating.

National is using double reduction with two separate cold-rolling operations before coating. The product is then given tin coatings of various weights in electrolytic tinning lines.

It was first believed National and other mills making thin tinplate had decided to coat the stock first and then make final reduction.

According to Wheeling Steel, full reduction before coating makes a product better suited to the requirements of canmakers. Another tinplate maker agrees that full reduction before coating would be more satisfactory.

Market Slowing Down — These developments came while the tinplate market is falling off seasonally. Fourth quarter shipments could be as much as 50 pct below third quarter, according to one producer. Another feels the dip may be less.

Last year shipments dropped from 1.4 million tons in the third quarter to 853,600 tons in the fourth, a decline of 40 pct.

Sheet and Strip—Auto demand for these products is still confused by the auto labor uncertainty. Generally, the automakers cancelled little tonnage. Steel shipments just piled up at mills and on rail cars.

PURCHASING AGENT'S CHECKLIST

Can business adjust to Kennedy administration? Laws passed by Congress don't tell the whole story. P. 44

Why aluminum makers cut mill and product prices. P. 46

Machine tool upturn slow to show up in new orders. P. 61

For many mills, October auto tonnage, while up over September, is still relatively low. At least one large auto company is apparently well stocked with steel right now. With the bloom off October, steel producers are looking ahead to November as the big auto steel month.

In the **Midwest,** non-auto steel users say they are holding down inventories. However, a few have placed sheet and strip orders through the fourth quarter. Some are even asking mills, without much success, to guarantee minimum tonnage for first quarter delivery.

Galvanized and enameling sheet are still running late on delivery.

Some users of flat-rolled products in the **Chicago** area are upset by delays of one week in mill deliveries. There are guesses there that strip may be on eight-week delivery by December. Cold-rolled sheet is expected to hit that range next month.

Plates and Shapes—The market continues to move along at fairly good levels. **Midwest** mill deliveries of heavy plate are stretching out at one large mill.

Structural mills are operating at about 75 pct of capacity with little change in the market.

Bookings of fabricated structurals hit the third highest monthly total of the year in August, according to the American Institute of Steel Construction. The 384,900 tons booked was only exceeded in May and July.

Total bookings for the year through August were 2.7 million tons, a gain of 7 pct over the same period last year.

Shipments of structurals in August were 359,400 tons, an increase of 25 pct over the previous month.

Ferroalloy Prices—An increase averaging less than 2¢ a pound of chromium on ferrochrome alloys has been announced by Union Carbide Metals Co., division of Union Carbide Corp. The new prices are effective on all shipments made on and after October 15.

COMPARISON OF PRICES

(Effective Oct. 2, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Oct. 2 1961	Sept. 25 1961	Sept. 1 1961	Oct. 4 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.49¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

	Oct. 2 1961	Sept. 25 1961	Sept. 1 1961	Oct. 4 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cents per lb‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$37.50	$37.50	$37.50	$29.50
No. 1 steel, Phila. area	40.50	40.50	40.50	33.50
No. 1 steel, Chicago	39.50*	40.50	39.50	26.50
No. 1 bundles, Detroit	34.50*	35.50	35.50	26.50
Low phos., Youngstown	42.00*	43.50	42.50	33.00
No. 1 mach'y cast., Pittsburgh	45.50	45.50	45.50	45.50
No. 1 mach'y cast., Phila.	49.50	49.50	49.50	49.50
No. 1 mach'y cast., Chicago	49.50*	50.50	49.50	41.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$39.17*	$39.50	$39.17	$29.83
No. 2 bundles	26.17*	26.83	25.83	20.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$31.00	$31.00	$31.00	$33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	122.00†	122.25**	124.25	102.75
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	24.00	24.00	26.00	26.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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* Appears in the Sept. 28-Oct 12 issues.

THE 5100 HOUSE

PETERSON
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Auto Lists Weaken Midwest Market

Industrial lists brought lower prices and markets affected slumped as a result.

Weakness is generally centered in the Midwest where automotive lists dominate the market.

■ The scrap market weakened in the Midwest this week and the uneasiness there threatened to spread.

Automotive lists in Detroit and Cleveland touched off a market drop. General weakness in Chicago resulted in a $1 drop across the board there. In coastal areas, export continued to hold up the market although uncertainty over total export tonnage caused some concern among dealers.

In spite of some 60,000 tons headed for export from the West Coast, this month, domestic apathy caused some softness there. Eastern markets are generally firm and weakness of the automotive lists is not likely to spread to these areas.

As a result of the decline in Chicago, the No. 1 heavy melting composite dropped to $39.17; the No. 2 bundles composite to $26.17.

Pittsburgh—The market here is generally steady. No. 2 bundles are reported weaker and the lack of activity has produced some dealer pessimism. However, most grades are holding firm in the face of price losses in other districts. A mill on the fringe of the district has come out with a price to the dealer of $38 for No. 1 heavy melting. The same amount was paid last month. The absence of a regular automotive list may have helped prevent a downward move. A large special offering is to be made this week, but more than half the October output is owed from last month. Also, higher prices in other districts have been putting pressure on local supply.

Chicago—The market here began to drop back as dealers began shipping increased material at lower prices, and mill purchases continue in low volume. A major automotive list was held up for about a week and could still affect the market if the material moved at higher price levels. Meanwhile, despite the slip of the past week, no long-term market weakness is expected.

Philadelphia — Prices are stable and demand is steady. Domestic pressure has eased. Export is more orderly, but far below the 100,000-ton monthly peak in May. Dealers await the railroad lists, due this week, which could affect the market.

New York—Prices are unchanged. Export demand continues to hold up steelmaking grades. And foundries in a nearby area confirmed cast grades for October. Several major dealers call the market firm and fairly steady. Prospects of bigger Japanese business this month apparently have been set back.

Detroit — An average drop of primary grades followed October's industrial list closeout. October scrap sellers offered 10 to 30 pct more tonnage than September. Local demand was virtually nonexistent for October material. Another factor behind the price drop is lag in export demand.

Cleveland — The market is off $2.50 on top grades as the market ran out of gas on production lists. A large tonnage of railroad scrap and re-bids on strike-lost auto tonnage still overhang the market.

Cincinnati — No. 1 grades are unchanged as an area mill entered the market for normal tonnage. Another large mill is staying out, working off inventory. Secondary grades are off $1.

St. Louis — The market here shows some signs of easing. However, most prices are still unchanged. Mills are not reaching out for as much scrap as they have been.

Birmingham—The market is virtually at a standstill with only a handful of orders being placed at established prices. Brokers say the market seems to have a softer tone, although it has not yet been reflected in purchases. Most of them anticipate only minor changes in early October buying. Dealers report more scrap coming into yards.

Buffalo — The market here is relatively quiet. Small tonnages of No. 2 bundles and turnings grades were sold early this week at quoted prices. Prices appear to be holding firm.

Boston — The market is quiet with few new developments and little activity. Steelmaking grades are holding firm but turnings are off slightly.

Houston—The market has shown signs of becoming spotty with prices quoted to meet the need of the moment. Export quotes have gone as high as $42 for No. 1 heavy melting with comparably higher export prices for No. 2 heavy melting and bundles. Prices quoted for machine shop turnings and shoveling turnings were in error in the Sept. 28 issue. Correct prices are $12 for machine shop turnings, $15 for shoveling turnings.

West Coast — Prices are soft in all coastal ports. Some dealers wouldn't be surprised to see a $2 to $3 drop soon. Domestic mills are buying only small tonnages. About 60,000 tons are scheduled to leave for Japan this month.

SCRAP PRICES *(Effective Oct. 2, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	38.00 to 39.00
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	46.00 to 47.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	52.00 to 53.00
RR specialties	48.00 to 49.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	190.00 to 195.00
18-8 turnings	115.00 to 120.00
430 bundles and solids.	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	39.00 to 40.00
Machine Shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs plate, ¼ in. and heavier	47.00 to 48.00
Low phos. 2 ft and under.	45.00 to 46.00
No. 1 RR hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	49.00 to 50.00
Rerolling rails	61.00 to 62.00
Rails 2 ft and under	52.00 to 53.00
Angles and splice bars	47.00 to 48.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles.	47.00 to 48.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	42.00 to 43.00
Cast iron wheels	35.00 to 36.00
Malleable	47.00 to 48.00
Stove plate	37.00 to 38.00
Steel car wheels	46.00 to 47.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00 to 115.00
430 bundles and solids.	95.00 to 100.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings.	29.00 to 30.00
Low phos. 5 ft and under.	43.00 to 45.00
Low phos. 2 ft punch'gs.	45.00 to 46.00
Elec. furnace bundles	44.00 to 45.00
Heavy turnings	27.00 to 28.00
RR specialties	45.00 to 46.00
Rails, 18 in. and under	54.00 to 55.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	43.00 to 44.00
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. 18 in. and under	42.00 to 43.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$39.50 to $40.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	39.50 to 40.50
No. 2 bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	41.50 to 42.50

Cleveland

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	36.00 to 37.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Cut structural & plates, 2 ft & under	41.00 to 42.00
Low phos. punch'gs plate.	37.00 to 38.00
Drop forge flashings	36.00 to 37.00
Foundry steel, 2 ft & under	35.50 to 36.50
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	47.00 to 48.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	38.00 to 39.00
Malleable	49.00 to 50.00
Stainless	
18-8 bundles	180.00 to 185.00
18-8 turnings	105.00 to 110.00
430 bundles	85.00 to 90.00

Buffalo

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	33.00 to 34.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Cast iron borings	15.00 to 16.00
Low phos. plate	39.00 to 40.00
Structural and plate, 2 ft and under	41.00 to 42.00
Rails 2 ft and under	50.00 to 51.00
Scrap rails, random lgth.	40.00 to 41.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	31.00 to 32.00
Foundry steel, 2 ft.	33.00 to 34.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	16.50 to 17.50
Shoveling turnings	18.50 to 19.50
Cast iron borings	27.00 to 28.00
No. 1 RR hvy. melting	40.00 to 41.00
Rails random lengths	43.00 to 44.00
Rails, 18 in. and under	46.00 to 47.00
RR specialties	43.00 to 44.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rail, random lgth.	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 dealer bundles	19.00 to 20.00
Mixed bor. and turn.	5.00 to 6.00
Machine shop turnings	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No.1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	33.00 to 34.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids.	175.00 to 180.00
18-8 turnings	80.00 to 85.00
430 bundles and solids.	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	31.50 to 32.50
No. 2 bundles	19.00 to 20.00
No. 1 busheling	31.50 to 32.50
Machine shop turn.	4.00 to 5.00
Shoveling turnings	9.50 to 10.00
Clean cast. chem. borings.	17.50 to 18.50
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	30.00 to 30.50

San Francisco

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	$40.00 to 42.00
No. 1 dealer bundles	33.00
No. 2 bundles	26.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	50.00

Los Angeles

No. 1 hvy. melting	$44.00
No. 2 hvy. melting	$39.00 to 41.00
No. 1 dealer bundles	33.00
No. 2 bundles	26.00
Machine shop turn.	16.00
Shoveling turnings	16.00
Cast iron borings	16.00
Elec. furnace 1 ft and under (foundry)	52.00
No. 1 cupola cast.	47.00 to 48.00

Seattle

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	$40.00 to 42.00
No. 2 bundles	26.00 to 27.00
No. 1 cupola cast.	36.00 to 37.00
Mixed yard cast.	31.00 to 32.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$30.00
No. 2 hvy. melting cut 3 ft and under	27.00
No. 1 dealer bundles	31.00
No. 2 bundles	23.50
Mixed steel scrap	22.00
Bush., New fact., prep'd.	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$37.00
No. 2 hvy. melting	34.00
No. 2 bundles	24.00
Machine shop turn.	12.00
Shoveling turnings	15.00
Cut structural plate 2 ft & under	$44.00 to 45.00
Unstripped motor blocks	28.00 to 29.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	28.00 to 29.00

Pressures Firm Copper Market

Copper demand continues to grow in a firm market.

Counter pressures are behind the new stability and one seller sees it continuing for the rest of the year.

■ Counter pressures have formed a firm U. S. copper market.

All major producers have just about closed their books for delivery in October. Sales executives report business is good. Several say November promises to be at least as good as October.

Ample Supply—But if a buyer needs small tonnage in a hurry, he has no real worry.

Traders and brokers in New York are holding the strong positions they took when a price hike appeared likely just a short time ago. There have been sales reported at ⅛¢ under the going U. S. price of 31¢ per lb.

Also taking the pressure off the price: Scrap copper prices have been tumbling, steadily and in small increments, for the last few weeks. They have now dropped under the break-even point for smelters at the current primary price.

Under Rate—Smelters can now buy No. 2 copper, the key grade, and convert it to primary metal for less than the going price of 31¢ per lb.

Also, futures markets in London and New York have been dropping for the last few weeks. The drop isn't steep. But it has been steady. And the end is not yet in sight.

Copper men caution against putting too much emphasis on these weakening factors, however. They point to the very strong speculative positions taken when the price appeared to be headed up, which now must be liquidated to some extent. These account for only a small fraction of all the metal moving in the U. S. market.

Growing Demand—Copper executives point out that demand continues to grow. Deliveries to fabricators topped production in the U. S. in the last few months. This has cut unsold supplies at refineries to very low levels.

Several small U. S. mines have been closed by strikes in the last week or so. But this is only cutting supplies at the rate of about 7000 tons per month. This is small, and hasn't been felt by buyers yet. The market seems to be little affected.

Continued Growth—One copper seller predicts the market will continue its current firm but comfortable course for the rest of the year. But he sees the possibility of problems in the first quarter of '62.

If business continues to improve, he believes copper from outside the U. S. will be needed to meet the demand. And the state of the European economy and demand may combine to determine the copper price.

Brass

Copper and Brass Research Assn., representing most of the leading brass mills in the country, is taking dead aim on the auto market.

At a press conference in Detroit this week, it was announced that Richard D. Chapman, former assistant chief engineer of basic sciences research for Chrysler Corp., is heading up the Cabra office in Detroit.

A Cabra spokesman said that recent interviews with auto people had indicated the need for better liaison with Detroit. He said further that this development indicates the industry has achieved the coordination and cooperation necessary to go after new markets on an all-industry front.

Forecast

What's ahead for nonferrous metals in 1962? "Individual companies within each industry group will find 1962 a year of intense competition," says Erik Windmiller, asst. vice president, Apex Smelting Co.

"Administered prices, while theoretically existing, have largely disappeared and this situation will probably continue throughout 1962. Narrow profit margins will continue to prevail. And a keen knowledge of both costs and competitive conditions will be required for successful operations."

Tin Prices for the Week

September 26—122.50; September 27—122.25; September 28—122.25; September 29—122.00; October 2—122.00*.
*Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	24.00	26.00	9/25/61
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 113.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)
("F" temper except 6061-0)

Alloy	.030-.037	.047-.060	.076-.096	.154-.250
1100, 3003	47.4	46.4	45.4	44.4
5062	54.8	52.0	49.8	46.8
6061-0	53.0	50.3	48.4	47.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Munta Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base 30,000 lb. f.o.b. customer's plant)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb)...$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz.....$75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz..$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per pg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 32.00
No. 120 ..... 31.25
No. 123 ..... 30.50
80-10-10 ingot
No. 305 ..... 36.00
No. 315 ..... 33.75
88-10-2 ingot
No. 210 ..... 43.75
No. 215 ..... 40.50
No. 245 ..... 35.75
Yellow ingot
No. 405 ..... 27.50
Manganese bronze
No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
0.30 copper max. 23.25-23.75
0.60 copper max. 23.00-23.50
Piston alloys (No. 132 type)...25.00-26.00
No. 12 alum. (No. 2 grade)...21.25-21.75
108 alloy 21.75-22.25
195 alloy 24.25-24.75
13 alloy (0.60 copper max.)...23.00-23.50
AXS-679 (1 pct zinc) 21.50-22.50

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 22.75-23.75
Grade 2—92-95% 21.50-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 19.50-20.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¾
Yellow brass	20⅜	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19⅛	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27
No. 2 copper wire 25
Light copper 22¾
*Refining brass 23¾
Copper bearing material 22¾
*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27
No. 2 copper wire 25
Light copper 22¾
No. 1 composition 24½
No. 1 comp. turnings 24
Hvy. yellow brass solids 19
Heavy yellow brass turnings. 18
Radiators 20½
Aluminum
Mixed old cast. ..... 12 —12½
Mixed new clips ..... 14 —14¼
Mixed turnings, dry ..... 13 —13¼

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 24 —24½
No. 2 copper wire ..... 22 —22½
Light copper ..... 19¾ —20¼
Auto radiators (unsweated).. 16½ —17
No. 1 composition ..... 21 —21½
No. 1 composition turnings .. 20½ —21
Cocks and faucets ..... 17¼ —17¾
Clean heavy yellow brass ... 15 —15¼
Brass pipe ..... 17 —17½
New soft brass clippings .... 18¾ —19¼
No. 1 brass rod turnings .... 16½ —17

Aluminum

Alum. pistons and struts .... 7 — 7½
Aluminum crankcase ..... 9½—10
1100 (2s) aluminum clippings 11¾ —12¼
Old sheet and utensils ..... 9½—10
Borings and turnings ..... 4½— 5
Industrial castings ..... 9 — 9½
2020 (24s) clippings ..... 10½—11

Zinc

New zinc clippings ..... 5 — 5¼
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1¾— 2

Nickel and Monel

Pure nickel clippings ..... 56 —58
Clean nickel turnings 43
Nickel anodes ..... 56 —58
Nickel rod ends ..... 56 —58
New Monel clippings ..... 26 —26½
Clean Monel turnings ..... 18½—19
Old sheet Monel ..... 25 —25½
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 7¼— 7½
Battery plates (dry) ..... 3 — 3¼
Batteries, acid free ..... 2 — 2¼

Miscellaneous

Block tin ..... 90 —92
No. 1 pewter ..... 65 —67
Auto babbitt ..... 46 —47
Mixed common babbitt ..... 10 —10½
Solder joints ..... 15 —15½
Small foundry type ..... 9 — 9½
Monotype ..... 9¼ — 9¾
Lino. and stereotype ..... 8½— 8¾
Electrotype ..... 8 — 8¼
Hand picked type shells .... 5¾ — 6¼
Lino. and stereo. dross ..... 1¾ — 2¼
Electro dross ..... 2½— 3

(Effective Oct. 2, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	13.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.30 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective Oct. 2, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Coke*s* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6, S15*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ^ COKES: 1.50-lb. add 25¢. ^^ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*			Hollowware Enameling 29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.		
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Oct. 2, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3, S15*		7.70 *B5*	6.725 *B3,R3, S15*	9.025 *B3,B5, S15*	8.30 *B3*	5.30 *B3*				8.00 *W6, S15*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1,*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, W13*		9.025 *A5, C13,W13*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,W13*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.10 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Oct. 2, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
S15 Seaway Steel Div., Roblin-Seaway Ind., Inc., North Tonawanda, N. Y.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
W13 Western Cold Drawn Steel, Div. of Standard Screw Co., Elyria, O.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery; Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.36	10.16	11.35	9.70	9.95	9.75	11.80	17.48	16.48	21.58	20.83
Birmingham		9.11	11.00	11.39	10.10	9.06	9.12	8.91	13.14	18.84	16.65	22.94	22.19
Boston**	.10	10.02	10.50	11.62	12.50	9.93	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.28	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.33	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	10.65	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	8.00	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.63	12.85	18.59	16.68	22.69	21.04
Milwaukee**	.15	9.51	10.49	10.42	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.68	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.85	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	10.66	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	8.97	9.64	10.79	11.14	8.81	9.32	8.97	11.64	.....	16.69	21.79	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Oct. 2, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	F dry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.50	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

(Minimum plating charge — $10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

		Discount Screws	Bolts
Full Cartons		46	46
Machine Screws—bulk			
¼ in. diam or smaller	25,000 pcs		50
5/16, ⅜ & ½ in. diam	15,000 pcs		50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	26.75	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	31.50	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	42.25	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	29.75	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1:* Claymont, Del; *P2.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

F.o.b. mill.

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Oct. 2, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annld	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2**	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½ In. Blk.	2½ In. Gal.	3 In. Blk.	3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

ELECTRIC FURNACE STEEL CASTINGS

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GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *UI*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *UI*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *UI*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	7.025	15.35
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10	.....	.....	.....	.....
Baltimore, Md. *T8*	9.50	10.70	12.90	15.50	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7,8*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Castle, Pa. *M10,*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

- Rolled elliptical, 18 in. or longer, 5000 lb lots 44.50
- Electrodeposited, 5000 lb lots..... 37.50
- OFHC anodes, 3 in. diam. (5000 lb) 42.50

Brass, 80-20, ball anodes, 2000 lb or more 51.50

Zinc, ball anodes, 2000 lb lots 18.25
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb 1.05
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.60

Tin, ball anodes $1.26 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90

Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45

Nickel sulfate, 5000 lbs 31.00

Nickel chloride, freight allowed, 100 lb 47.50

Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80

Zinc cyanide, 100 lb, N. Y. 61.50

Potassium cyanide, 100 lb drum Chicago, del'd east of Rockies... 46.50

Chromic acid, flake type, 10,000 lb or more, N. Y. 30.94

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

- Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50
- Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75
- Carbonyl Iron (200 lb lots) 88.00
- Welding Grades 8.10
- Cutting and Scarfing Grades 9.85
- Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

- Electrolytic, domestic, f.o.b. shipping point. 15.00†
- Atomized ..... 44.3 to 62.3
- Reduced ..... 15.00†
- Chemically Precipitated 45.5

Brass, 5000-lb lots ..... 33.1 to 50.3

Bronze, 5000-lb lots ..... 51.5 to 56.8

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum .....$3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 56.0 to 68.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 15.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten, carbide grades... $3.25

Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
Stainless Type 302	.....	.....	.....	37.50
304	28.80	31.55	34.30	39.75
316	42.20	46.25	50.25	58.25
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	.....
410	22.70	24.85	27.00	.....
430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective Oct. 2, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

- Super duty, Mo., Pa., Md., Ky.... $185.00
- High duty (except Salina, ..., add $5.00) 133.00
- Medium duty 125.00
- Low duty (except Salina, Pa., add $2.00) 103.00
- Ground fire clay, net ton, bulk... 22.50

Silica Brick

- Mt. Union, Pa., Ensley, Ala. $158.00
- Childs, Hays 163.00
- Chicago District 168.00
- Western Utah 183.00
- California 185.00
- Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. 163.00-168.00
- Silica cement, net ton, bulk, Chicago 26.75
- Silica cement, net ton, bulk, Ensley, Ala. 27.75
- Silica cement, net ton, bulk, Mt. Union, Pa. 25.75
- Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

- Standard chemically bonded, Baltimore, Md. $620.00
- Gary, Ind. 658.50
- Standard, Pascagoula, Miss. 647.50
- Standard chemically bonded, Curtiner, Calif. 119.00
- Burned, Baltimore 585.00

Magnesite Brick

- Standard, Baltimore $715.00
- Chemically bonded, Baltimore 655.00
- Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅜ to ½-in. grains

Per net ton

- Domestic, f.o.b. Baltimore in bulk. $73.00
- Domestic, f.o.b., Pascagoula, Miss... 80.00
- Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 46.00
- in sacks 52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:

- Pa., W. Va., Ohio $16.75
- Missouri Valley 15.60
- Midwest 17.00

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Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
Ohio Seamless Tube	3	12	62.62	73.40	55.59
Div., Copperweld	3½	11	73.11	85.70	65.84
Steel Co.*	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

* Electricweld only.

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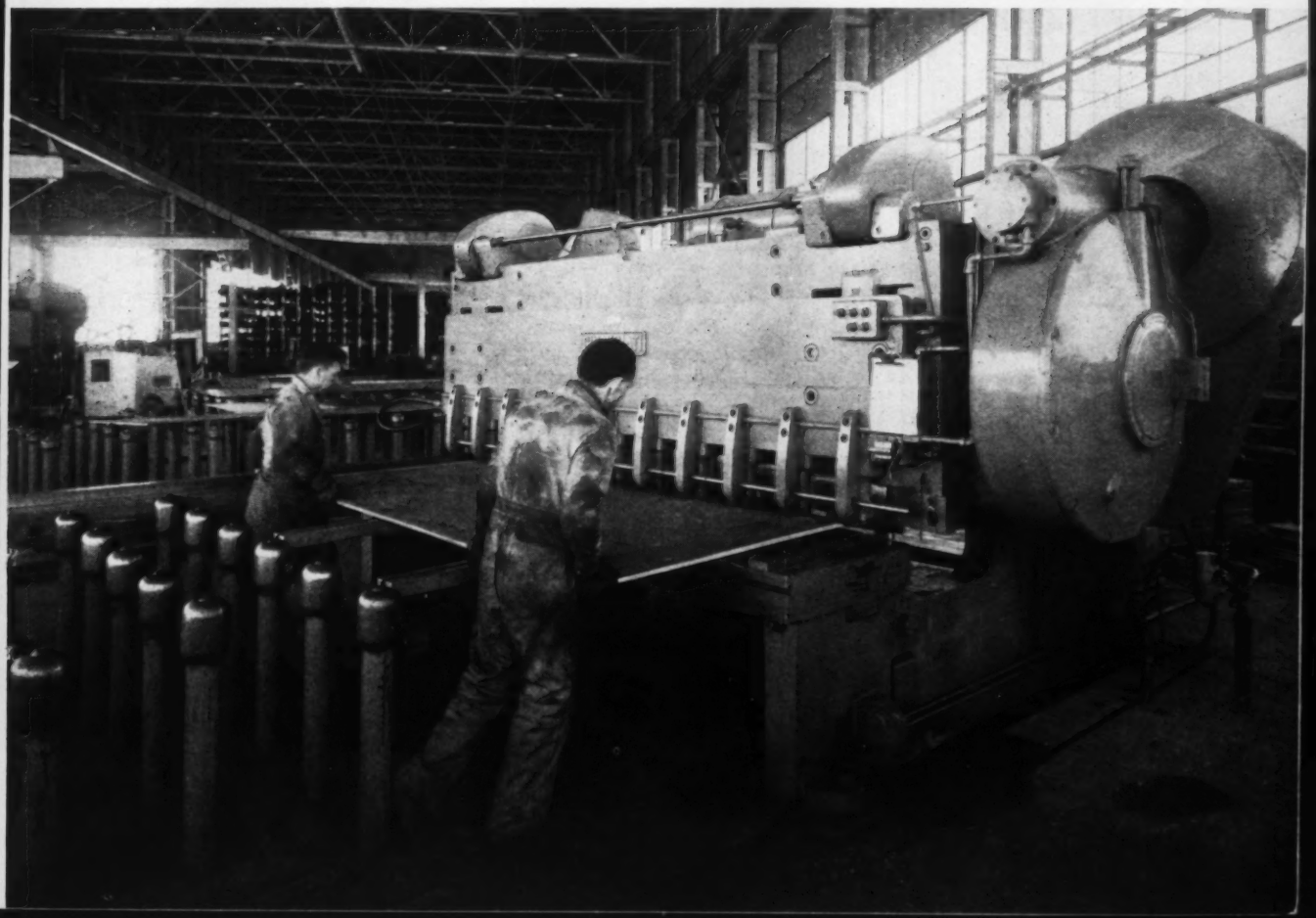

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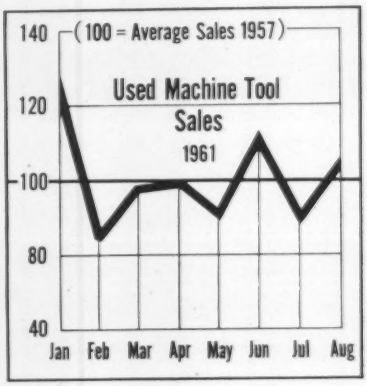
Dealers Mark Time During Crises

Used machinery dealers are keeping a sharp eye on international developments.

Feeling across nation is that slight improvement in world situation would aid the business upswing.



■ From coast to coast, used machinery dealers are keeping up with the international news and following each new development with close interest.

"Much depends on the international picture. If the current situation clears up at all, we should see the domestic markets surge ahead at a little better pace than they have for the past year or so," says R. K. Vinson, executive director, Machinery Dealers National Assn. He has just finished a three-week swing around the nation, talking to dealers about current business conditions and future prospects.

Good Feeling—"There seems to be a healthy desire for people to buy," says Mr. Vinson. "But they're holding back. The confused international situation has spread into the business climate. But this wait-and-see attitude shouldn't last much longer. Just a slight improvement internationally should affect used machine sales noticeably."

National used machine sales jumped 18.7 pct in August from July's dollar volume. This was also a slight increase over August, 1960. Dealers feel the stepped-up accent on defense accounted for some of the gain, but much of it was seasonal.

Good Stocks—Dealers have a good inventory of excellent machines, Mr. Vinson reports. In August, they sold more machines than they placed in inventory, so stocks dropped a bit. Most dealers are concentrating on their inventory position now, and closer control is the key.

Hopeful Outlook—Forecasts for the fourth quarter across the nation lean to optimism. West Coast dealers look for a boost from defense buildup. Lower priced machine sales are gaining in Chicago. And inquiries have been picking up in New York.

Consensus: Hopes and signs of continued gains across the board.

Monthly sales have fluctuated since the peak in January, which was abnormal and followed severe weather that suspended business activity. A complete review of the year's activity to date, plus economic forecasts for the future, will come at the MDNA board meeting in Cleveland, October 11.

The industry is still working towards improving its export situation. Representatives are going through government channels now and hope to make definite progress in this direction next year.

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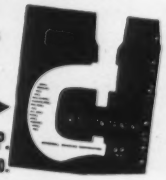

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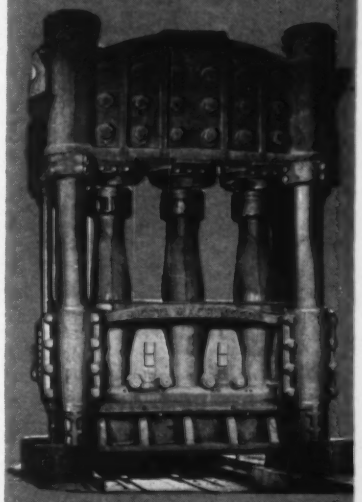

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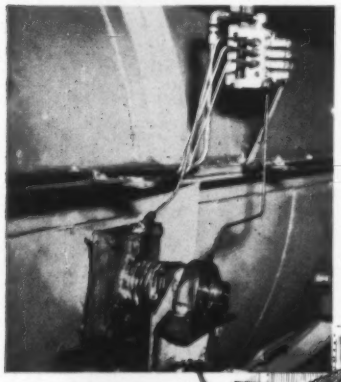

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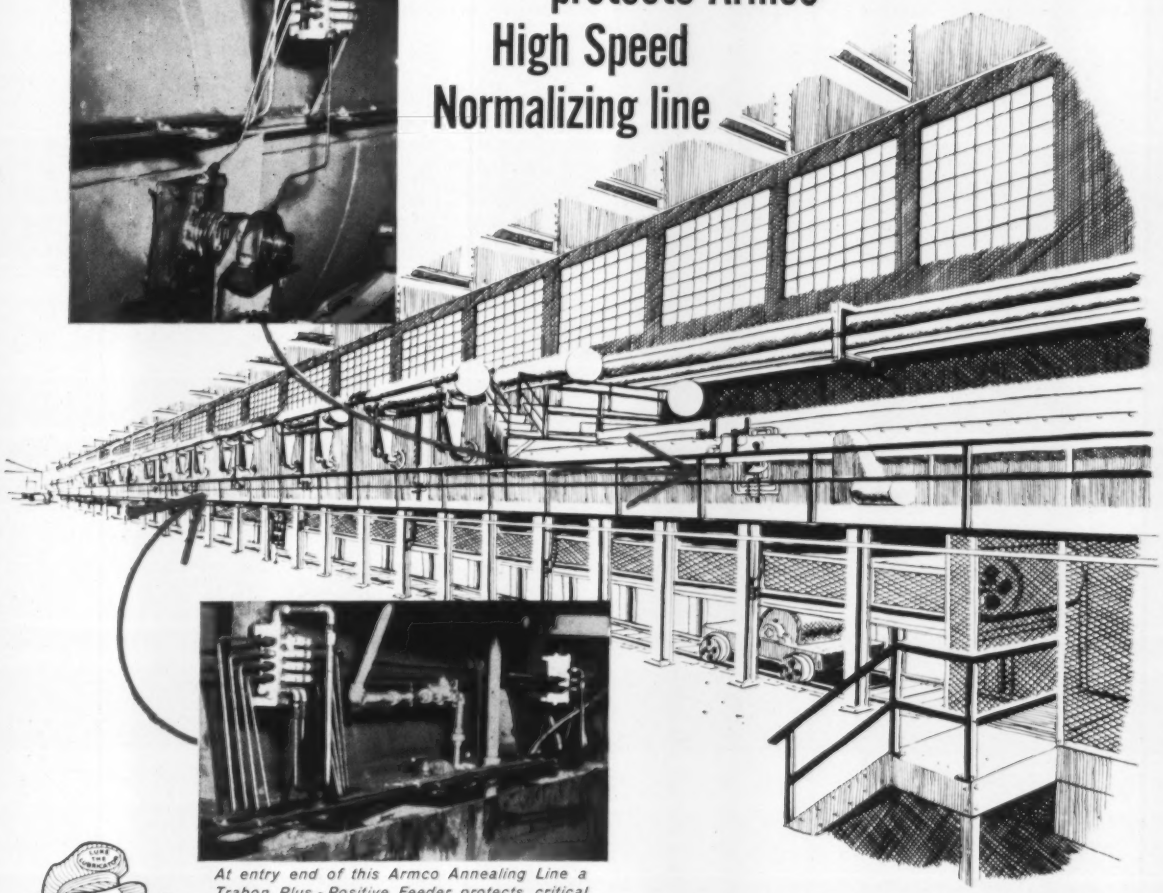

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